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OVERSEAS RAILWAYS

SPECIAL NUMBER OF THE RAILWAY GAZETTE

On November 28 was issued a Special Number of "The Railway Gazette" devoted entirely to recent progress made by, and current problems affecting, various railways in the Dominions, Colonies, and other countries such as Argentina and Brazil where British-owned railways operate. This number is additional to the ordinary weekly issue and has been sent to all regular subscribers. Extra copies, price 1s., may be obtained through any newsagent, or direct from the Publisher, post free, 1s. 3d.

DIESEL RAILWAY TRACTION

A Supplement illustrating and describing developments in Diesel Railway Traction is presented with each copy of this week's issue.

Publicity for Britain

THE task of making the attractions of Great Britain known abroad must be considerably lightened by the popularity which publicity of this type enjoys. The annual report of the Travel and Industrial Development Association of Great Britain and Ireland records that during the past year the demand from foreign countries for its cinematograph films of British life has exceeded the supply and that it is hoped to extend the library as soon as funds are available. Posters of British scenes have also been well received, and in Germany and France these are preferred with captions in English rather than in translation. These posters are reproduced from the collection of photographs which the association distributes free to the overseas and foreign press. The booklet on Great Britain originally published in French and Dutch now appears in a Spanish edition. Four steamship companies have ordered reprints of the book, with their own insets and names on the cover, for overseas publicity purposes. In addition to advertising Britain generally, the association has now begun to publish folders dealing with specific areas. Norfolk and East Kent have so far been treated in this way. Press advertising, displays at exhibitions, and broadcasting are other media whereby the association disseminates a message which deserves the support of every transport interest.

* * * *

One Cause of Overcrowding

In drawing the attention of the Minister of Transport last Tuesday to alleged overcrowding on the Metropolitan suburban line of London Transport, as reported on page 907 this week, Mr. Goldie might have added that the evil results partly from the herd proclivities of passengers. Season ticket holders can be divided roughly into two classes—those who insist that seats shall be found near the front, and their no less cunning brethren who maintain that accommodation exists only at the rear. The result is that while both parties travel in a state of compression which forbids them even the pleasure of a sneeze owing to the impossibility of reaching a handkerchief, the majority of those in the centre carriages have sufficient latitude for all the normal processes of respiration, and are able to move their arms if so minded. This, of course, is subject to the absence of those misguided Samaritans who cannot resist prodding a standing passenger in the back in order to reveal to him, with the air of one who discloses a Promised Land, some six square centimetres of seating space indiscreetly situated under the bows of an elderly spinster. The problem is partly one of distribution.

* * * *

The Week's Traffics

Traffics of the four group companies for the past week go against good takes for the corresponding week in 1933 except in the case of the Southern. The coal traffic increase on the L.N.E.R. for the past week compares with an increase of £10,000 in the 1933 week, and the merchandise increases in the 1933 week were £47,000 for the L.M.S., £33,000 for the L.N.E., and £19,000 for the Great Western. For the 47 weeks of 1934 the aggregate traffics of the four companies together amount to £134,782,000, an increase of £5,150,000 or 3·97 per cent. In passenger train traffics the total for the four companies is £60,202,000, an increase of £833,000. Merchandise traffics, at £47,247,000, show an improvement of £2,913,500, and in the coal class traffics of £27,333,000 there is a gain of £1,403,500.

	47th Week				Inc. or dec.	
	Pass &c.	Goods, &c.	Coal, &c.	Total.	Year to date	
	£	£	£	£	£	%
L.M.S.R. ..	+ 13,000	+ 12,000	+ 12,000	+ 37,000	+ 2,141,000	+ 4·13
L.N.E.R. ..	+ 2,000	+ 1,000	+ 9,000	+ 12,000	+ 2,022,000	+ 5·33
G.W.R. ..	+ 4,000	+ 1,000	— 2,000	+ 3,000	+ 588,000	+ 2·67
S.R.	+ 2,000	+ 500	— 2,500	—	+ 399,000	+ 2·24

* * * *

Cross Country Train Services

Since the institution of the Sunny South Express early in the present century, no appreciable acceleration of its schedule has been made. At first it ran daily throughout the year, but of recent years the service has been reduced to one each way weekly, except during the summer months when it runs daily. A correspondent, who has travelled

frequently by this train, writes to suggest that its popularity might be enhanced if it were found possible to accelerate it and to alter its timing in the northbound direction so that it could reach its various destinations earlier than at present. The suggestion draws attention to the possibilities of other cross country trains, the schedules of which would seem to be capable of acceleration in view of the improved locomotive power now available. There is no question that such trains are a great convenience in enabling through journeys to be made without the necessity of crossing London or making frequent changes, but the timetables reveal the fact that in certain cases it is actually quicker to travel via London than by the through trains.

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Overseas Railway Traffics

A slight variation downwards has taken place in the Argentine exchange for the past week which has averaged 17·08 pesos to the £, compared with an average of 17·05 pesos for the previous week. Receipts in currency have been down during the past fortnight on the Central Argentine which has a decrease in sterling of £110,208 for that period. Traffics on the Buenos Ayres Great Southern for the past week were weakened by wet weather with the result of decreases of 270,000 pesos and £60,903, and its sterling decrease for the fortnight amounts to £102,667. The Buenos Ayres & Pacific continues to have increases in currency, but it is £20,770 behind in sterling for the past two weeks. During the same period the Buenos Ayres Western shows a decrease of £32,218 in sterling and a net decrease of 15,000 pesos. Canadian Pacific traffics have improved to the extent of £96,400 in the fortnight, and those of the Bombay, Baroda & Central India are £21,225 less.

Railway.	No. of Week.	Weekly Traffics.	Increase or Decrease.	Aggregate Traffic.	Increase or Decrease.
		£	£	£	£
Buenos Ayres & Pacific	21st	71,429	– 10,297	1,439,280	– 287,208
Buenos Ayres Great Southern ..	21st	116,979	– 60,903	2,529,781	– 716,220
Buenos Ayres Western	21st	44,496	– 16,602	859,250	– 264,041
Central Argentine	21st	101,227	– 56,828	2,461,458	– 410,304
Canadian Pacific	46th	523,200	+ 45,600	22,301,000	+2,090,600
Bombay, Baroda & Central India	33rd	153,675	+ 1,050	4 890,525	+ 215,100

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Twenty-five Years of Suburban Electrification

December 1 marks the 25th anniversary of the public opening of the South London line from Victoria to London Bridge, which was the first stage in the electrification of the L.B.S.C.R. suburban routes. Since 1929 all single-phase operation has been superseded by the standard 650 volts d.c., but the choice of high-tension alternating current was well justified when the types of energy available in the years 1906-09 are considered, and it was only the war which prevented extensive electrification with this system of supply. The possibility—even at that time—of extending electrification to the Brighton main line was a deciding factor in the choice of current, and although single-phase traction has been severely criticised in this country, the Brighton equipment was mechanically efficient and financially successful. The final reason for conversion to electric working was the falling off in traffic resulting from the electrification of the L.C.C. tramways and the introduction of petrol-engined buses. The number of passengers on the South London line dropped from 8,000,000 in 1903 to 3,500,000 in 1908, but in the first year after electrification, 1910, the number rose again to 8,000,000, and by 1920 had increased to 12,000,000. The electrification was extended before the war from Victoria and London Bridge to Crystal Palace; at the same time it was decided to convert the Coulsdon and Sutton lines, but owing to the war these were not opened until 1925, when they formed the swan song of single-phase traction in this country. Along with the other a.c. lines, they were changed over to d.c. operation in 1929.

* * * *

Improving Railway Carriage Ventilation

Air conditioning has become virtually standard practice for all new carriage construction in America, and, as we announced last week, a very big programme is being undertaken there of equipping existing cars with air-conditioning.. It is probably safe to say that within the next two or three years all the principal passenger trains in the States will be composed of air-conditioned vehicles. America is the home of air-conditioning, where the term is used to include thoroughgoing temperature, humidity, purity, and velocity control of the air admitted to the carriages, and, strictly, it should not be used to define only certain of these requirements. In an article by Mr. Stuart Miall which appeared in THE RAILWAY GAZETTE of September 7 last, it was shown that, to assure the comfort of travellers by train, it is essential not merely to regulate the temperature and purity of the air in the carriage, but to vary its humidity in accordance with the temperature, and also to make sure that the air within the carriage is replaced often enough to assure its proper content of oxygen. Such air-conditioning is, of course, expensive both to instal and to run, although apparently results in the States are considered amply to have justified the expense. At a smaller cost, however, there is much that can be done to improve railway carriage ventilation, and we are pleased to record in our News Section this week the progress that is being made, particularly by the London & North Eastern Railway, in this connection.

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Another Level Crossing Accident

An unfortunate illustration of history repeating itself is provided by a level crossing accident which occurred on Tuesday morning last. An L.N.E.R. train from Cambridge to Liverpool Street ran into a motor lorry at Wormley, between Broxbourne and Cheshunt, with the result that the locomotive and several coaches were derailed and both enginemen unfortunately killed. The crossing is an occupation one. In all these respects, except that only the fireman lost his life on that occasion, the disaster is similar to that at Shepreth on August 17, 1928, inquired into by Colonel Trench whose report was summarised in our issue of May 3, 1929. Reference thereto will show that that officer said "it is evident that carelessness on the part of drivers of heavy road vehicles may cause serious risk of a train accident involving a number of lives." How near have those words come true in the present case! It will, we hope, have been appreciated that both these accidents occurred at occupation crossings, as to which Colonel Mount said in his last annual accident report that " no specific responsibility is placed on railway companies by legislation for safeguarding the movement of road vehicles or pedestrians."

* * * *

Single Line Working through Tunnels

Among the assistant inspecting officers' reports on the more serious accidents to railway servants during the three months ended March 31 last, was one relating to a fatal accident to a permanent way man in a tunnel 1 mile 1,224 yd. long. Some 70 men were engaged in relaying a length of the down line in the tunnel, for which operation single line working was to be put into force. The men arrived on the job at 4.20 a.m. Soon afterwards a light engine passed on the down line without stopping, and the inspector in charge, seeing the pilotman on the footplate, realised that single line working was about to commence, so he began to have every other key knocked out

and three fishplates bolts removed from each joint. Shortly afterwards a double-headed goods train passed, in the right direction, on the up line, which filled the tunnel with smoke and steam. The majority of the men, including the deceased, Williams, took up position along the tunnel wall on the down side waiting for the air to clear. After standing there for about 15 minutes, the horn was sounded for a down train and there were shouts from the men themselves to "Look out, down road." Williams took this literally and crossed to the up side. After the train had passed, his body was found in the "four-foot" of the up line. Mr. J. L. M. Moore inquired into the accident and, whilst blaming Williams for not obeying Rule 234 (*a*) and standing clear of all lines, he draws attention to the breach of Rule 193 (*c*) as to the pilotman warning men at work on the line when single line operations are to begin. The engineman, too, failed to obey Rule 204 as to "popping" the whistle frequently. Mr. Moore says, on the latter point, "the popping of the whistle is intended as an indication that something unusual is taking place and it might, in this instance, have prevented the accident."

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Light Railways in the Netherlands East Indies

The economic crisis has had a serious effect on commerce in the Netherlands East Indies, and has reacted on the fortunes of the railways there, especially those private concerns operating light railways, tramways and bus services. Some of the reports of these concerns for the past financial year are before us and make most depressing reading. The traffic again declined considerably on almost all routes, despite the various measures we referred to a year ago, in our issue of November 4, 1933. The sugar industry has been acutely depressed and this has led to a heavy fall in railway goods traffic. The spread of unemployment has in turn reduced the demand for passenger travel, so that the unfortunate companies feel the crisis in two ways. Motor competition has been steadily increasing and the appearance of a small vehicle called a bus but holding only six passengers, operating with complete freedom and subject to little or no taxation, has intensified the evil from the railway standpoint. Some of the companies are now operating their own bus services. Without an improvement in the general situation we fear there is little chance of these lines seeing better times, although they have done much to lower operating costs in recent years.

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Towards Permanent Way

Many good papers were read at the recent Roadmasters' Convention at Chicago, among which that by Mr. Robert Faries of the Pennsylvania Railroad was outstanding. Mr. Faries examined the question of whether permanent track construction could be financially justified. A reinforced concrete roadbed has been in service for some years in experimental lengths on the Pere Marquette line, and has proved quite satisfactory from the practical point of view. Mr. Faries calculated that such construction, arranged for present day axle loads and heavy traffic, would cost $72,400 a mile and its maintenance and capital charges would amount to $4,733 per annum. The estimated cost of the present form of construction for similar conditions was $32,000 a mile and the annual charges for maintenance and capital $3,013 per annum, or $1,720 in favour of the present type of construction. A further saving of about $225 a track mile per annum might result from decreased train resistance. Of these figures it may be noted that only $170 would be required for the actual maintenance of the concrete type, against $630 for the ordinary permanent way—which throws rather a striking light on how far the present methods of financial accountancy are from presenting a true reflection of realities. Mr. Faries went on to point out that a good deal more could still be done to achieve greater permanence than at present by the provision of ample drainage and ballast, improvement in rail steel, precision surface grinding of joints, increased weight and stiffness of rail, and the universal preservative treatment of sleepers.

* * * *

American Locomotives in 1934

The past twelve months or so have witnessed some notable developments in the locomotive stock of various U.S.A. railways. On the Baltimore & Ohio a 2-6-6-2 type Mallet locomotive, No. 7400, was experimentally converted into a 4-4-6-2 type for passenger service but, not coming up to the requirements of that service, it was reconverted to its original state. On the same line a 4-6-2 Class P-1c of 205 lb. pressure and 26 in. by 28 in. cylinders was converted to a 4-6-4 Class V-1 with 350 lb. pressure and cylinders reduced to 21½ in. by 28 in. but with the tractive effort raised from 44,600 to 52,000 lb. After some tests it was fitted with roller bearings and seems to have given satisfaction. The most remarkable development on the Baltimore & Ohio is the appearance of the new 4-4-4 high-speed streamlined locomotive with 7 ft. driving wheels, a photograph of which is reproduced on page 904. It will be noticed that there are certain British characteristics about this locomotive, including the copper rim on the top of the chimney. On the Pittsburgh & West Virginia Railroad, a small line whose chief traffic is the haulage of coal from the West Virginian mines, ten new Mallet 2-6-6-4 locomotives are in course of delivery from the Baldwin works. Reference is made in the following note to some 4-8-4 locomotives for the Northern Pacific, which are remarkable for their thoroughly up-to-date design and which are illustrated on page 904.

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Locomotives for Long Distance Runs

When preparing designs for locomotives which will have to make long through runs, factors otherwise not specially important have to be taken more strictly into account. In the course of a long journey the nature of the country traversed and the running conditions generally may be very varied, and where changes of locomotives are made one type of engine is often superseded for the next section by a completely different type. The Northern Pacific Railway has at present under construction by the Baldwin Locomotive Works ten locomotives destined to haul the North Coast Limited trains continuously between points separated by a distance of 906 miles, one of the longest engine runs in the world. These engines are of the 4-8-4 type with twelve-wheeled tenders, and all axles are equipped with roller bearings. They have single-expansion cylinders measuring 28 in. diameter by 31 in. stroke cast integrally with the main cast steel frame, and the boilers carry a steam pressure of 260 lb. per sq. in. The coupled wheels are 6 ft. 5 in. in diameter and the total heating surface with superheater is 7,138 sq. ft. with the large grate area of 115 sq. ft., the fuel available having only about 10,800 B.T.U. per lb. The engine develops a tractive force, with 70 per cent. cut-off, of 69,800 lb. These are large dimensions and it is not, therefore, surprising to learn that the engine and tender in working order weigh 390 tons. The design and proportions typically represent the latest standards in American locomotive practice for fast long distance runs with heavy passenger trains.

New South Wales Government Railways

IN the report for the year ended June 30, 1934, which is signed by Mr. T. J. Hartigan, Commissioner for Railways, the financial result achieved is shown to be satisfactory in view of the heavy fall in the revenue from the carriage of wheat, flour, and wool, and the additional expenditure on renewals and partial renewals of the permanent way. Total earnings were £515,134 less than in 1932-33, but working expenses were reduced by £763,128 so that the profit on operations improved by £247,994. The Government contributed £800,000 towards loss on working of country developmental lines, but heavy statutory charges had again to be met, and the final result is a deficit of £2,588,127, which is, however, £772,355 less than that for the previous year. Of the deficit no less than £1,061,428 represents exchange payments. Earnings from first and second class travel decreased by £2,835 and £181,496 respectively, but workmen's ticket receipts increased by £28,082. Travel has been greatly stimulated by the 10 per cent. reduction in fares which was made in November, 1933. Suburban tickets increased by 4,404,228 and country tickets by 311,785, and the sharp decline of first class travel, so noticeable during recent years, has been arrested and distinct progress has been made in recovering this traffic.

The new practice of making sleeping berths available to first class excursionists on long-distance journeys has proved popular, but the experience with second class sleeping berths on the Sydney-Broken Hill express trains was disappointing, and this facility was withdrawn after four months' trial. From September, 1933, second-class sleeping accommodation has been provided on the North Coast mail trains with better results, but has not yet been patronised enough to warrant its permanent retention. Continuation of the practice of naming certain trains, each painted in an attractive colour scheme, has had the effect of advertising tourist districts, and also maintaining the interest of local residents in their own railway services. A dining car service has been introduced on the Melbourne Limited express trains. As announced in THE RAILWAY GAZETTE of September 28, 1934, there has been an all-round speeding-up of services. In the same issue was mentioned the introduction of a new type of high-powered railcar. This, which comprises a rail motor with trailer and brake van, has been put in service on the Coonamble branch, and has been much appreciated because of its greater comfort and the saving of 50 minutes on the journey between Coonamble and Dubbo. Additional educational railway cruises have been carried out with complete success.

In the previous financial year a reduction of 10 per cent. was made in the freight rate on wool and live stock, and from July 1, 1933, a further 10 per cent. reduction was made on these rates. This later reduction is estimated to amount to £184,325 for the year under review. There were substantial increases in the tonnage of coal and minerals carried during the year under review, but 637,951 tons less of grain, flour, &c., were conveyed. Revenue from grain, flour, &c., was £548,331 less, and from wool was £181,840 less, but general merchandise receipts improved by £361,675, and coal and other minerals brought in £117,409 more. These two advances are particularly satisfactory as a barometer of the general trading activity throughout the State.

Expenditure on renewals and partial renewals of the permanent way increased by £260,912 and contributions to the Railway Superannuation Fund advanced by £43,200. The ratio of working expenses to earnings is the lowest since 1927. The scheme of reorganisation mentioned in the last report has had a full year's trial, and has shown somewhat remarkable results. It will be continued, with a constant eye to the improvement of all-round efficiency in all branches. A new system of telephone train control has been introduced. From headquarters at Central Station, train control is exercised over the passenger and goods sections in the Sydney area, and over the country sections to Newcastle, Lithgow, Goulburn and Mowra. Further extension of the system to embrace the Newcastle and North Coast areas is being undertaken and gradually the whole of the State will be covered. Sanction has been given by the Government to an advance of £3,300,000, free of interest, to be spread over three years for expenditure on railway track and rolling stock. This amount is to be repayable by annual instalments over a period of 20 years. An important innovation, designed to secure by competitive examination capable youths of high character for lengthy periods of intensive engineering training, has been introduced.

Some comparative figures are given in the accompanying table:—

	1933–34	1932–33
Miles open	6,163¾	6,164
Train-miles	25,173,199	25,562,220
Passengers	142,520,429	132,867,221
Goods and coal, tons	10,643,139	10,491,769
Operating ratio, per cent.	75·24	77·68
Percentage return on capital	£2 12s. 4d.	£2 8s. 1d.
	£	£
Passenger receipts	4,869 234	5 025,484
Goods and coal receipts	6,784,353	7,069,375
Total earnings	14,890,186	15,405,320
Working expenses	11,203,520	11,966,648
Net earnings	3,686,666	3,438,672

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Madras & Southern Mahratta Railway

IN addition to the company's and State lines the Madras & Southern Mahratta Railway Company works 271½ miles of Mysore State lines, 51 miles (metre gauge) of the West of India Portuguese Railway and a further 126½ miles belonging to States and District Boards. At March 31, 1934, the company's own system consisted of 1,119 miles on the 5 ft. 6 in. gauge, of which 3¾ miles were quadruple track and 48¼ miles double track, and of 1,662 miles on the metre gauge. The total length worked was 3,230 miles, the same as at the end of the previous financial year. In connection with other railways broad gauge main line routes are provided from Madras to Calcutta, Bombay, and Upper India, and there is direct metre gauge communication with Poona. Connections are made with both the metre gauge and broad gauge lines of the South Indian Railway. All projects for new construction have remained in abeyance. The more important works for which capital funds had to be provided were the completion and equipment of the remodelled Perambur workshops, the remodelling of the yard and the electrification at Hubli, and periodical track renewals. On rolling stock the expenditure was Rs. 9·76 lakhs, including locomotives for both gauges and 300 metre gauge goods wagons provided in replacement of old units.

From the report for the year 1933-34 it appears that gross earnings of the entire system, exclusive of refunds, were Rs. 31·29 lakhs higher than for 1932-33, expenses increased by Rs. 12·04 lakhs, and net earnings improved by Rs. 19·25 lakhs. Passenger traffic was still influenced by the general economic depression, and although the raising of passenger fares in 1932-33 checked the decline

of revenue receipts in that year, the continued fall in numbers brought down passenger revenue by some Rs. 20 lakhs. There was intensive bus competition, but this is being countered as far as possible by the measures taken by the Government to regulate and co-ordinate road and rail traffic, by the quotation of lower fares on certain sections, by the introduction of diesel railcar services in suitable areas, and the improvement and adjustment of short distance train services. Goods earnings as a whole increased by more than Rs. 50 lakhs, to which general merchandise contributed an improvement of nearly Rs. 47 lakhs. The most valuable feature was the increase in oil seeds—mainly ground nuts, the commodity which provides the greatest individual source of revenue—in which the tonnage rose from 394,000 tons to 664,000 tons, and the earnings from Rs. 52·59 lakhs to Rs. 91·45 lakhs. All the main classes of expenses have risen, partial restoration of pay cuts having had an influence on each class. Repairs were considerably heavier, due to the fact of much work having been postponed in the previous year because of the strike in the workshops. The larger volume of traffic naturally led to some increase in operating expenses, but these were largely balanced by a saving under fuel. Some comparative figures are given in the accompanying table:—

	1933–34	1932–33
Mean mileage worked	3,236	3,236
Train-mileage	13,162,162	13,006,220
Passengers	31,729,772	34,646,466
Goods, tons	5,424,755	4,930,811
Operating ratio, per cent.	55·95	56·68
	Rs. lakhs.	Rs. lakhs.
Coaching receipts	271·46	293·56
Goods receipts	476·93	426·79
Gross earnings	772·38	741·09
Working expenses	432·08	420·04
Net earnings	340·30	321·05

The company's share of surplus profits from State and company's lines for the year 1933-34, less Indian income tax and supertax, amounted to Rs. 27,31,192 (against Rs. 23,64,961). Adding Rs. 58,418 surplus profits from the Mysore State Railway, as compared with Rs. 59,596 for the previous year, gives a total which realised £209,452, comparing with £182,797 for the previous year. The total distribution to stockholders (including the 3½ per cent. guaranteed interest) will be 9½ per cent., as against 9 per cent. for 1932-33, and 10 per cent. for each of the two years before that.

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Electricity Supply to Railway Companies

WHEN the L.S.W.R. initiated its scheme of extensive suburban electrification it arranged to generate power in its own station at Durnsford Road, Wimbledon, but, with this exception, the "world's greatest suburban electrification" is of necessity supplied with power by the various "authorised undertakers" in the areas concerned. As Sir Herbert Walker pointed out yesterday in a letter to *The Times* which we reproduce on page 909, the experience of the Southern Railway in carrying out recent electrification schemes has demonstrated the importance of negotiating with a single authority for the supply of electric power and the difficulties and disadvantages which arise when a railway company is under obligation to make individual agreements with "authorised undertakers" within the territory to be served by a scheme of electrification. The Electricity (Supply) Bill, which passed the Lords early this year but was dropped on November 16 from the programme of business for last session, is again before Parliament, and is warmly welcomed by the railway companies as it proposes to permit the Central Electricity Board to supply the railways direct from the grid with current for traction purposes. Despite certain misconception on the point, the Bill provides adequate safeguards for existing electricity suppliers, as it specifically prohibits the Central Electricity Board from entering into a supply agreement with a railway company until it has satisfied the Electricity Commissioners that the terms and prices will not result in a financial loss to the board. If further schemes for railway electrification are to be entertained, it is obvious that the whole matter, including that of power supply, should be capable of consideration on a national rather than a parochial basis, and therefore the railway companies consider it essential that they should be permitted to negotiate with and obtain their current direct from the Central Board. This right the Bill now before Parliament proposes to afford, and it is to be hoped the Government will see its way clear to afford it a quick passage.

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Railway Workshop Re-organisation in South Africa

THE recently issued Report of the Granet Commission appointed to investigate the financial position and working of the South African Railways was summarised briefly in our issue of September 21 last. It is an unusually comprehensive document, and we have referred to it several times subsequently. The subject of mechanical workshops and their re-organisation is dealt with at considerable length. There are seven main works in the Union and each is controlled by an officer bearing the title of Mechanical Engineer. The foremen of the various shops are directly responsible to the Mechanical Engineer, and, as the latter is of necessity engaged on general administrative and staff matters most of the time, especially in the larger works, it is impossible for him to give great attention to the detailed management of the shops. It is, therefore, considered that an improvement in the organisation could be effected by the amalgamation of several co-related works into one branch with a works manager in charge who would be responsible for ensuring co-operation between the shops and for uniformity in their management. A recommendation is put forward that two works managers should be appointed under the Mechanical Engineer to supervise and control the two separate branches of each works, namely, the locomotive branch and the carriage and wagon branch. Under the existing organisation each foreman has several chargemen under him whose duties comprise supervising a number of workmen. It is recommended in the report that the position of chargeman be abolished, and that leading hands should be appointed under the foremen to take charge and to participate in the work and bonus earnings of the piecework gangs. The leading hands would work to definite instructions as to the nature and extent of the work to be performed. It is further observed that the sphere of activities of foremen is altogether too extensive and that, with the introduction of the post of works manager, a part of their duties should be transferred to that officer. With the disappearance of the chargemen, foremen will undertake their proper work, *i.e.*, supervising the execution of the work determined upon by the examiners.

The report further discusses the arrangements for the shopping of engines, and the conclusion arrived at after studying these arrangements is that the present system is generally satisfactory. There are, however, a number of

points connected with light repairs to which attention is directed. It is considered that the locomotive foremen should, when presenting an engine for shopping, indicate as clearly as possible the nature and extent of the repairs which, in their opinion, are necessary. This information would be very useful to the Mechanical Engineer who would, of course, still be the final arbiter of what repairs should be undertaken. The importance of examiners is here stressed, and when determining the repairs to be executed due regard must be paid to the mileage which the engine has run since the last heavy repair. The view is advanced that it is not economical for extensive light repairs to be undertaken in running sheds owing to the lack of specialised knowledge of the staff employed there, the unsuitability of the equipment and the longer time taken in effecting such repairs in running sheds as compared with mechanical workshops. Whilst the multiplicity of types of engines in South Africa makes the position difficult, the opinion has been arrived at that a considerable reduction can be effected in the times taken in heavy repairs.

With regard to coaching stock, the average time such stock is under repair varies at the different works, although the types of coaches in South Africa are very similar. At Salt River, for example, the time taken in 1932-33 was 117 days, while at Pretoria and Durban the repair times were 102 and 90 days respectively, and at Bloemfontein 70 days. After considering this matter in all its aspects, the conclusion has been reached that the times locomotives, coaches and wagons are under repair are excessive, and that with proper re-organisation and the adoption of improved methods of work as indicated elsewhere in the report, the average times should be very considerably reduced. Heavy repairs to locomotives should not exceed 35 days, whilst intermediate and light repairs should, respectively, take not more than 25 and 12 days. An allowance of 40 days is suggested for heavy repairs to coaches, and 14 days for similar repairs to wagons.

The introduction of progress schedules, or their extension on a larger scale, is strongly recommended, and it would be one of the functions of the works manager to work out a works schedule which must be rigidly adhered to. The progressive system proper, also known as the belt system, which has been introduced almost universally in the manufacture of new articles, can be applied only in a modified form to repairs, especially in South Africa, as variations in the amount of work to be done and the classes to be repaired are too great to permit of a progressive system of work based on regular time intervals being maintained. The progressive system has not yet been systematically applied on the South African Railways, and it is recommended that steps should be taken for the introduction of this system on a general scale. The value of standardisation of the separate parts of vehicles in order to economise in the maintenance of the rolling stock is fully appreciated by the administration. A large percentage of the component parts is already standardised and the system is being extended. The report recommends that consideration be given to the question of taking standardisation a step further by the introduction of standard fits so that parts will fit without any further finishing, thus enabling them to be changed over from one vehicle to another. With regard to the trials of a locomotive after a heavy repair; at present only one trial trip without load is undertaken, and it is recommended that a locomotive should be further tested, under the supervision of the workshop, on a second trial trip with full load in order that possible defects could be detected. This could be arranged on a regular train by double-heading. The report deals further with matters concerning piecework bonus systems, the cost of repairs to rolling stock, the amalgamation of workshops and proposals for their further development. It would appear, however, that the commissioners have spared no effort to make as thorough an examination of the mechanical side of South African railway working as of the more purely administrative aspect.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Making Travel Even Easier

Stand 12, The Stock Exchange,
London, E.C.2.
November 27

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Recently returning from Spain, on changing at Hendaye, the French frontier station, into the Paris express, I noticed a device, which, if more universally adopted, would without doubt be of great assistance to the travelling public. Above each end of the corridor was a sign *Toilette Occupe*, which lit up when the bolt on the lavatory door was turned, thus intimating the exact state of affairs, which could be seen on leaving one's compartment, without what is very often a fruitless walk. It is only a trifle, but appeared to me worthy of consideration for the passenger's comfort.

Yours faithfully,
GERALD E. ROTHSCHILD

[A similar device has been adopted on the L.N.E.R. —ED. *R.G.*]

Railways and Road Progress

Ashwood, Halstead,
Sevenoaks, Kent.
November 25

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The Minister of Transport, Mr. Hore-Belisha, addressing his constituents recently, stated (according to press reports): "I am desperately anxious that the motoring industry should be not only the most prosperous, but the most popular method of transport."

If this statement means anything, it means that the motoring industry is not at present in the happy position in which he is "desperately anxious" to see it, and, further, that in order to bring about such a state of affairs, the position of the railways must be relatively worsened. Mr. Hore-Belisha is a man of action, possessing by virtue of his office power and influence; his anxieties of the past have led him to undertake wholesale revolutionary experiments. That desperation should be allied to anxiety of the kind indicated may be assumed to portend vigorous action towards the end in view.

Perhaps some Member of Parliament, interested in railway prosperity, will give the Minister an opportunity to recant or amplify a statement which may be ominous or merely extravagant.

Yours faithfully,
H. A. MATSON

[The increased prosperity of the motoring industry need not necessarily be achieved at the expense of the railways or of any other industry. It is all a matter of finance. If the desire of the public to travel more were liquidated by increasing available purchasing power, every channel of transport could be filled. Perhaps the Minister of Transport had this in mind.—ED. *R.G.*]

PUBLICATIONS RECEIVED

The Socialisation of the Electrical Supply Industry. By G. H. London: Victor Gollancz Limited, 14, Henrietta Street, Covent Garden. 7½ in. × 5 in. 104 pp. Illustrated. Price 3s. 6d. net.—Of all industries there is probably none more efficient than that which supplies electrical energy. Its capacity is for all practical purposes unlimited; it can meet any demand; it is as reliable as any. Yet here is a book, purporting to come from a responsible quarter, which solemnly sets forth how this great industry should put its house in order—or, rather, threatens the seizure of the house and its rearrangement by persons less expert than those already in charge. Were electrical supply in any way unreliable, were it insufficient, there might be some excuse for this suggested interference, this threatened curtailment of liberty. An idea of how inelastic life would be in the Socialist Utopia may be gained from the following, in regard to the Weir Report on railway electrification: " . . . if transport is socialised, it may well be that a decision can definitely be made as to the volume of traffic which the railways will have to handle." That is symptomatic. Let us beware and leave our efficient industries in the capable hands that already direct them. It is only necessary to assure markets for their output, and this can be done by the issue of national dividends.

The Romance of Engineering. By Dr. A. D. Merriman, M.A., A.I.Mech.E. London: Geo. G. Harrap & Co. Ltd. 8½ in. × 5¾ in. × 1½ in. 272 pp. Illustrated. Price 7s. 6d. net.—In the weeks before Christmas publishers invariably produce popular volumes on engineering topics to meet the needs of "present" purchasers. Many of such books are either innocuous or dangerously inaccurate, and few survive the one season. Dr. Merriman's volume is in neither category and may justly be classed as an introductory text book combining an accurate and readable presentation of engineering fundamentals with an historical background. Doubtless the word "romance" was introduced into the title to attract popular sales, but, although there is true romance in engineering development and achievement, the popular connotation of the word may tend to obscure the essential value of the present volume.

The author is Principal of a large technical school in Newcastle-on-Tyne and has had much practical experience as an engineer besides being a qualified lecturer and writer on the subject. Each chapter is designed to bring out the historical and human aspects, and, while reference to mathematics has been avoided, the book is none the less useful to the young engineer. The perfection of the steam engine, for example, with the social and industrial changes connected therewith, is traced back to the demand which arose for a powerful pumping medium when supplies of coal accessible at or near the surface became exhausted, and the problem of working mines not possessing natural drainage had to be faced. A valuable feature of the book is the clarity with which the many mechanisms and engineering principles covered are explained both in text and diagram. Particular interest attaches to the chapter on bridge-building, for it is certain that the complexity of finished structures obscures the fundamentals underlying them from many observers, who will consequently welcome Dr. Merriman's description of the basic types.

In dealing with railways, the author makes a brief survey of progress from the days of Trevithick to the introduction of the modern high-speed diesel train. He gives an excellent, but necessarily condensed, outline of the evolution of the steam locomotive, and in connection with internal-combustion engines explains with great clarity the sequence of the Otto cycle.

Other subjects covered include the steam turbine; the steamship; aeronautical science; hydraulic engineering; the making of iron and steel; and the utilisation of sun and water power. Many excellent half-tone illustrations, of which some of the railway subjects are reproduced by courtesy of the G.W.R., L.M.S.R., and L.N.E.R., complete a volume of considerable merit.

Electric Arc and Oxyacetylene Welding. By E. Arthur Atkins. London: Sir Isaac Pitman & Sons Ltd., 39, Parker Street, W.C.2. 7½ in. × 5 in. × 1 in. 350 pp. Price 7s. 6d.—This is the second edition of a book written for the operative at a price within his reach. The subject matter includes two excellent chapters of *don'ts* for welders, another chapter on the avoidance of explosions, and two more covering the metallography of welds. Despite its low price and single authorship, this book compares well with those of multiple authorship published by firms of welding engineers. So simple is the style that the author seems at first sight to care little for theoretical aspects. However, it becomes apparent on reading further that he draws upon wide and varied experience and a sound knowledge of fundamentals.

A large number of examination questions are inserted at the end of the book for the use of those who wish to test their knowledge. It was while scanning these that our attention was drawn to certain surprising omissions in the text. For instance, certain questions refer to shock prevention when using alternating current, to the prevention of hard spots in welded cast iron, and to the welding of stainless steels. Save for one passing reference, the text ignores the use of alternating current, and the subject is not mentioned in the index. The same applies to the welding of stainless steels. In the sections dealing with welds in cast iron, no reference is made in either text or index to the use of nickel-copper electrodes for arc welding. We trust that such omissions will be rectified in the next edition, as they tend to mar an otherwise commendable book.

Die Technik und Wirtschaft der Hygiene in Tierversand bei der Deutschen Reichsbahn. (Live Stock Traffic on the German State Railway: A Study of the Equipment Installed for Hygienic Purposes.) By Dr.-Ing. Kurt Walter with a preface by Prof. Dr.-Ing. C. Pirath. Berlin: Verkehrswissenschaftliche Lehrmittelgesellschaft m.b.H. 8½ in. × 6 in. 215 pp. No price stated.—This book gives an excellent account of the arrangements in force on the German State Railway for ensuring the efficient cleaning and disinfection of wagons used for the conveyance of livestock. The proper carrying out of such operations is of vital importance in international traffic, when infection can come from afar and may spread over a large area. Germany learnt long ago the effect of inadequate precautions, for great harm was caused in the 'seventies by an outbreak of disease among cattle that rapidly spread to an alarming extent. Nothing has been left undone in recent times and, as this volume proves, the equipment now installed for ensuring the utmost cleanliness in the handling of livestock has attained great efficiency. The various disinfecting and cleansing processes used are explained and discussed. A number of selected installations at important stations are described in detail, with photographs, diagrams and tables showing economic aspects. Some 40 out of the 175 disinfecting stations on the Reichsbahn are brought under an analysis of costs and capacity. Road transport is now beng used for livestock, either in competition or co-operation with the railway, and the author deals with the necessary organisation for handling road vehicles efficiently. There are in Herr Walter's book many valuable suggestions for improving certain processes and for the more economic organisation of the service, making the work one of the most complete ever published on this important matter.

Winter Travel.—Dean and Dawson Limited sends a programme of winter travel arrangements for holidays at home and abroad. Rail fares, including night travel tickets, are shown from representative provincial towns to London, the Channel Isles, and the principal resorts of southern England. Spain, the French Riviera, and North Africa are among the centres to which tours will depart regularly during the winter months. Switzerland will be served by an extension of the popular William Tell reserved railway accommodation facilities introduced last summer.

THE SCRAP HEAP

WESTON-SUPER-MARINA

A correspondent inquires whether, following the example of Bognor Regis, Weston-super-Mare is to change its name as above.

* * *

John M'Cole, Burtonport, who acted as guard on the train at the time of the derailment, said he saw the fireman jumping for his life, and asked him if he was hurt. He said he was not.—*From the "Derry Journal."*

* * *

THE RAILWAY SANDWICH JOKE CROPS UP AGAIN

"He sat down close to an outjutting reef of quartz to have a sandwich. Noticing its formation he struck it idly with his hammer. The top broke away, revealing the nugget inside." — *Daily Paper — From "Punch."*

* * *

Sleeping on an American train going south is a pitiful thing, because on the pictures an American sleeping car is always a tremendously exciting and jolly affair, and really it isn't. There is nothing in the least jolly about trying to undress while lying down behind a flapping curtain, and my only excitement was as to how on earth I was ever going to get back my trousers which had somehow fallen out into the aisle. —*John Gibbons in "Suburban Columbus."*

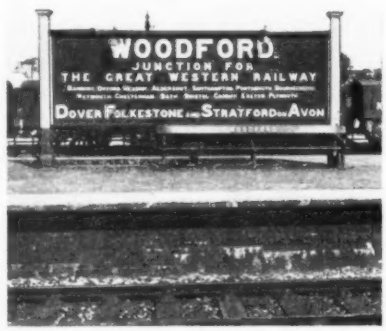
* * *

When the Shrewsbury-Hereford railway line was laid there were two vast oak trees at Moreton, one of the stations on the line, called Adam and Eve. A house was needed for the stationmaster and Eve was chosen. She was quite hollow, and it only needed to thatch in her trunk and build a door to make her habitable. For additional comfort a brick fireplace was built, and the station-master then took possession. Eve had a girth of twenty-five feet, so she was quite as large as the average cottage parlour.—*From "The Sheffield Weekly Telegraph."*

* * *

CHANGING AT WOODFORD

A relic of the first days of the Great Central extension to London is still to be seen in the ambitious wording of the station nameboard at Woodford, which figures in the photograph reproduced herewith. The opening of the spur line from Woodford to Banbury, linking up with the Great Western, created a new route from the north to the South Eastern and Chatham line via Banbury and Reading, and the passenger was—and still is—exhorted to change at Woodford for "Banbury, Oxford, Reading, Aldershot, Southampton, Portsmouth, Bournemouth, Weymouth, Cheltenham, Bath, Bristol, Cardiff, Exeter, Plymouth, DOVER, FOLKESTONE, and STRATFORD-ON-AVON." After this extraordinarily comprehensive geographical survey of the south and west of England "Stratford-on-Avon" comes in the nature of an anti-climax, though it is, strictly speaking, the only name in the whole series that really need appear, seeing that practically the only services which give good connections to the south and west are those which run through from the north to Banbury and beyond, and so do not involve the passenger in any changing at all at



Woodford. Our sympathy would go out to any luckless wight who in these days saw fit to believe this notice-board to the extent of getting out at Woodford in an endeavour comfortably and speedily to reach Dover or Folkestone!

* * *

ANOTHER TICKETLESS TRAVELLER

The practice of "hopping freights," as America describes the snatching of free rides on goods trains, found an unusual exponent in this country a short time ago in the shape of a fox, which thus escaped the attentions of some dogs pursuing it. Having been chased to the edge of a cutting, the animal leapt on to a passing train, and, landing on top of a truck of coal, was safely carried out of sight. The dogs showed a disposition to follow but were called off by their owner, not out of consideration for the fox but for fear they should be run over by another train.

* * *

BOVRIL AND THE RAILWAYS: SLOGANS INTRODUCING RAILWAY TERMS

Railway travellers cannot fail to have been amused at the ingenuity displayed by Bovril Limited in introducing familiar railway terms in the advertisements which this firm displays at railway stations. In our issues of August 26, 1932, and May 5, 1933, we published a list of Bovril slogans which have been used from time to time in connection with railway advertisements. Since then several new slogans have been added to the list. We reproduce our previous lists in full, together with the first eight which are new slogans:—

He'd rather Mrs. Train than Mrs. Bovril.
If you've Mr. Train Don't Miss Bovril.
Tour better than one—if they're Bovril sandwiches.
Bovril renders express service in emergency.
Luggage in advance but always take Bovril sandwiches.
The engine was coaled—so they gave it Bovril.
What made the boiler fitter? Daily Bovril.
Guards flag—if they miss their daily Bovril.
If you lose your train don't lose your Bovril.
Bovril will carry you further than the train.
If you train on Bovril you won't miss your train.
Tickets please! So do Bovril sandwiches.
Bovril makes ordinary fare first-class.
All change until they try Bovril.
If you can't go by train go buy Bovril.
The fastest train on Bovril.
Bovril sandwiches for all holiday occasions.
Bovril is first-class fare.
Guard against chills and colds with Bovril.
Don't cross the line. Don't forget your Bovril.
Of signal service in sickness—Bovril.
Before the next (s)train take Bovril.
The Scotch Express great faith in Bovril.
Travel free from colds on Bovril.
You will never find Bovril in the lost property office.
For every season Bovril is the ticket.
Tourists return in health on Bovril.
No summer excursions without Bovril sandwiches.
Your "Guard's" name is Bovril.
2-40fy take Bovril.
Fog signals to take Bovril.
Bovril the goods for the passenger.
Bovril brightens old buffers.
Faulty sleepers need Bovril.
A Bovril season gives that first-class feeling.
Doctor's express instructions were Bovril.
Refreshment room for Bovril.
Don't spa with your health, drink Bovril.
A daily Bovril is cheaper than a weakly season.

A small reproduction of one of the posters is also given.

* * *

A correspondent writing in *The Daily Telegraph* seventy-five years ago said: "It is quite time that it should be made compulsory for railway companies to carry a light in every carriage at night. Any person might, to satisfy the ferocity of some wanton scoundrel, be severely maltreated, and unable to identify his assailant."

OVERSEAS RAILWAY AFFAIRS

(*From our special correspondents*)

South African special arrangements for unveiling of Livingstone memorial—Viaduct reconstruction and road-rail conferences in India—Second U.S.S.R. five years' plan —South Manchuria reorganisation and gauge conversion on C.E.R.

RHODESIA

David Livingstone Memorial

In connection with the unveiling of the David Livingstone Memorial at the Victoria Falls, on August 5, special arrangements were made by the Rhodesia Railways to deal with the large number of people attending the ceremony, of whom a considerable proportion were members of the Federated Caledonian Societies of South Africa. Two through special trains were run from Johannesburg to the Falls, and the ordinary mail train was duplicated from Bulawayo to the north and a special week-end train at an "all-in" fare was provided for Bulawayo residents. At the Victoria Falls Hotel all accommodation was filled, and many visitors slept and had meals in trains stabled in the station.

The memorial is sited close to the Devil's Cataract, and consists of a bronze statue of Dr. Livingstone on a granite pedestal. Before being dressed the pedestal weighed approximately 50 tons, and is believed to be the largest piece of rock ever quarried in South Africa. After dressing to its final shape it weighed 37 tons, and its transport from Pretoria to the Falls made railway history, as an article of freight of this nature and weight had not previously been carried over the South African or Rhodesia Railways. A temporary siding a mile long was laid to the site of the statue, and the off-loading of the pedestal from the truck into its position a few feet away took the contractors two days.

INDIA

Shoranur-Cochin Gauge Conversion

In connection with the opening of the Shoranur-Cochin branch of the South Indian Railway as a broad, instead of, as formerly, a metre gauge line, reported on page 720 in THE RAILWAY GAZETTE of November 2, it may be mentioned that Cochin harbour has been recently constructed as such, and forms the only haven protected from the open sea on the south-west coast of India. There are, therefore, very considerable prospects of its development, especially now that it is directly linked with the S.I.R. broad gauge system without break of gauge. Formerly it was served by a 65-mile metre gauge branch taking off the main broad gauge line at Shoranur junction. The cost of conversion is stated to be about Rs. 80 lakhs (£600,000). A large number of bridges had to be reconstructed, and several stations and yards were remodelled. The original line was opened to traffic in 1902.

Bridge Reconstruction on Hill Railway

About two years ago it was noticed that a masonry arch viaduct on the Kalka-Simla Railway, located about half-a-mile from Simla, had developed cracks in the arches and piers. The gradual enlargement of these cracks rendered railway traffic over the bridge unsafe and the North Western Railway administration decided to rebuild the bridge. It was found that the reconstruction of the arches and piers, after making provision for the diversion of traffic during the work, would be very costly, and it was therefore decided to convert the viaduct into a trestle structure. Temporary support was first provided under the four arches that were badly cracked. A temporary staging was then erected to carry the track, thus relieving the arches and piers of all load prior to dismantling. On the completion of the dismantling, concrete footings were cast, the trestles erected, and the load transferred to them. The work was completed in four months without any hindrance to the passage of trains. This is the first trestle bridge on the Kalka-Simla section.

Road and Railway Problems

Two important conferences will shortly be called at New Delhi to consider the road and railway problems of the country. The first of these meetings will be held early in December, when provincial representatives and various business interests will foregather to discuss road problems. The creation of an Indian Roads Congress on a permanent basis, the discussion of papers on various aspects of road development, the institution of suitable machinery for the regular pooling of knowledge and experience of road problems and the co-ordination of effort between the different interests, will form the main items on the agenda of the conference, arrangements for which are being carefully prepared by Mr. Mitchell, Road Engineer with the Government of India. Although the conference will be unofficial in character, it has official support and sympathy and will be opened by Sir Frank Noyce, Member of Industries.

The other, and official conference, to be held in January, will be in the nature of a second session of the Road-Rail Conference that met at Simla in April, 1933. It also will be presided over by Sir Frank Noyce and will be attended by Ministers in charge of Public Works Departments in Provincial Governments, and their technical advisers, representatives of railways and motor transport, and other interests concerned with transport. The object of the conference will be to co-ordinate for the public benefit the policies of the various authorities and interests concerned with the future development of road and railway communications. The proceedings of the Simla Road-Rail Conference of April, 1933, were referred to in THE RAILWAY GAZETTE of June 2, 1933.

Railways and Commerce

Sir Norroji Saklatvala voiced the opinion of the commercial communities in India when, at the annual meeting of the Tata Iron & Steel Company, he pleaded for an independent Railway Rates Tribunal vested with full authority to fix rates of transport which would be fair alike to railways and industries. The Acworth Committee many years ago recommended the setting up of a Rates Tribunal, for the present Railway Rates Committee is only an advisory body, subordinate to the Railway Board. Sir Norroji also observed that in the new *régime*, India would require a competent Railway Authority completely free from political trammels.

Jodhpur Railway Extension

The Jodhpur Durbar has provided a sum of Rs.16 lakhs for capital expenditure on the Jodhpur Railway during the financial year which began on August 1 last. Open line works will absorb Rs. 9 lakhs and the balance of Rs. 7 lakhs will be spent on lines already under construction. The extension of the Jodhpur Railway from Marwar Railway Junction to Phulad is the most important construction now in hand, and the work is proceeding satisfactorily. The intervening Aravalli range of hills necessitates a difficult ghat section in this construction. The line, which will provide a direct railway route between the Jodhpur and Udaipur States, is expected to be opened in the cold weather of 1935-36.

New Tramway Proposed

It is understood that the United Provinces Government has under consideration a scheme to construct a 28-mile tramway in the Meerut District to facilitate the transport of sugarcane and other agricultural products.

The projected line will take off from Daurala on the North Western Railway in the direction of Mowana on the Anupshahr Ganges Canal, and be worked by steam locomotives. It is not intended to carry passengers.

U.S.S.R.

Railways in the Second Five-Year Plan

The Birmingham Bureau of Research on Russian Economic Conditions has just published a memorandum examining the Second Five-Year Plan and the prospects of its being realised. At the beginning of this year it was reported by the People's Commissar for Transport that there were about a million wagon-loads of untransported goods, of which timber alone accounted for 430,000, and coal (which was required for industry and the railways themselves) for 76,000 wagon-loads. There were also huge quantities of general commodities, such as salt, bread and fish, awaiting transport. In fact, it was admitted that railway transport had been relegated to the smallest place in the national economy. The railways were in a very bad state of repair: the Soviet production of rails at that time could not meet the renewal requirements, and a large proportion of the sleepers were rotten, even on main lines. This condition of the permanent way had become a source of great damage, and was the cause of the premature deterioration of the rolling stock and engines.

This state of affairs is in part due to the fact that almost all the responsible directors are chosen from among the Communist class, irrespective of whether they have any technical knowledge or not, whilst the specialists occupy unimportant posts. In the words of M. Andreyev, the People's Commissar for Transport, "it often happens that the specialist is not allowed to assume direct responsibility, and on the other hand the Communist director will not assume it himself, thus a complete state of irresponsibility prevails."

As regards the transport proposals in the Second Five-Year Plan, the same coefficient of increase which was reached by transport in the First Five-Year Plan has been fixed for the second. Since, however, according to the Birmingham Bureau, gross production of industry is to be increased by 114 per cent. and that of agriculture by 100 per cent., it is not clear how the railways would be able to cope with the transport of all the goods involved if their transport capacity is planned to increase by only 78 per cent.

One of the principal reasons for the present critical position of the railways, states the bureau, is the insufficient development in the transport capacity during the First Five-Year Plan, when it was decided to increase the freight turnover by only 86 per cent., the increase of industrial production being simultaneously fixed at 136 per cent., and that of national income at 103 per cent. How this discrepancy arose may be explained by an examination of the planning of the annual rates of increase for railway transport (per cent.):—

Year	Control Figures*	Five-Year Plan	Fulfilment
1925–26 ...	33·3	—	39·9
1926–27 ...	11·7	—	16·4
1927–28 ...	12·7	—	10·8
1928–29 ...	9·3	9·6	16·6
1929–30 ...	21·7	12·7	28·8
1931 ...	35·2	13·3†	4·7
1932 ...	26·0	14·1†	7·2
1933 ...	12·0	16·9†	1·2

* The Birmingham Bureau of Research explains that Control Figures for the National Economy of the U.S.S.R. are plans of development established by the Central Executive Committee in the session called in December or in January for the year then commencing. From 1925 to 1930 they covered the "economic year" (October 1 to September 30), and since 1930 they refer to the calendar year (January 1 to December 31).

† For the economic years 1930–31, 1931–32, and 1932–33.

During the years 1925-1930 the transport on the railways considerably and consistently exceeded the estimates of the plans. On the other hand, expenditure on repairs of the lines and expansion of their transport capacity continually lagged behind the estimates, with the result that in 1931 matters came to a head when the railways were unable to increase their transport capacity to any appreciable degree. Since that year, however, the organisations engaged in planning began to increase considerably their planned estimates.

Summing up the main economic indices of the Second Five-Year Plan the bureau says it would appear that the experience gained from the operation of the First Five-Year Plan has been inadequately utilised by the State Planning Commission and has had, in fact, little weight in the compilation of the Second Five-Year Plan.

SPAIN

The Fuel Problem

The Railways Companies' Association of Madrid has submitted a memorial to the Government on behalf of all the associated companies, asking that the question of the compulsory use of Spanish coal be reconsidered. At present all railways are compelled to use from 85 to 90 per cent. national coal, the prices of which are fixed periodically by the Government. The association points out that while the official prices index stands at 171·2 in respect of 1913, the corresponding index for coal is maintained at 207·8. It is pointed out that the railways absorb quite a third of the national production, and it is upon the railway industry, already cruelly depressed by the inability to raise charges to cover expenses, that the high cost of fuel bears most hardly. Then again, as the association points out, while the coal miners have been highly favoured by past governments, at the expense of the consumers, this preferential treatment has not prevented an insidious wave of syndicalism, fomented, it is more than suspected, with the very subventions granted to improve the social conditions of the miners, and leading latterly to a convulsion which has cost the nation an incalculable loss and very serious prejudice to the interests, such as the railways, which had contributed most heavily to this misplaced treatment. The only solution, states the memorial, is to restore free dealing in fuel within the country, remove the obligation to consume national coal, and abolish the system of fixed prices, while relying on the customs tariff alone to provide protection against the competition of foreign coal.

THE FAR EAST

New Lung-Hai Railway Terminal Port

On October 7 the new port of Lienyunkang, near Haichow, was opened for shipping. This port will form the eastern terminal of the Lung-Hai Railway, which is being extended to it. Plate-laying on the Sunchaishan-Laowo section of this extension has been in progress for some little time, and it was expected that it would be opened for traffic on November 1.

S.M.R. Reorganisation

According to *The North-China Daily News*, preparations are in progress for the re-organisation of the South Manchuria Railway Company into a joint Manchukuo-Japanese undertaking. The projected concern is expected to be capitalised at Y.1,000,000,000, of which Y.400,000,000 will be funded by the South Manchuria Railway Company, Y.400,000,000 by Japan, and Y.200,000,000 by Manchukuo. All the railways now managed or controlled by the S.M.R. and the C.E.R. will be included in the new enterprise.

Chinese Eastern Railway

It is estimated that a sum of Y.6,000,000 will be required to modernise the southern section of the C.E.R. thoroughly, and to alter the gauge from 5 ft. to 4 ft. 8½ in., so that the Asia Express and other trains will be able to run straight through from Dairen to Harbin. The negotiations between Mr. K. Hirota, the Japanese Foreign Minister, and Mr. C. Yureneff, the Soviet Ambassador to Japan, regarding the sale of the C.E.R. have not yet been finally concluded, but the Manchukuo authorities are now claiming (1) that the Soviet Union has treated this railway as if it belonged exclusively to that State, and (2) that since 1921 the Soviets have "stolen" 168 locomotives, 200 passenger carriages, and 900 freight cars, valued at 15,880,000 gold roubles.

HINTS FROM OVERSEAS RAILWAYS

Some extracts from the Special Overseas Number of "The Railway Gazette" which may be worth while investigating by home and other overseas administrations

A Special Overseas Number of THE RAILWAY GAZETTE *was issued on November 28, and has been sent to all annual subscribers. This Number is devoted entirely to recent progress made by, and current problems affecting, various railways in the Dominions, Colonies, and other countries such as Argentina and Brazil where British-owned railways operate. It contains a valuable fund of information regaraing various problems confronting railway administrations in all parts of the world. The following extracts from articles in this special issue may serve as subjects worthy of investigation by other administrations at home and abroad who may be confronted with similar problems and difficulties.*

Overseas Visits Recommended

Overseas visits by officers are also strongly recommended; they should be systematic and frequent, and of sufficient duration to enable the officers concerned to make a thorough investigation of the subjects entrusted to them. With regard to the employment of European unskilled labour, the Commission expressed the opinion that, provided the number of such labourers was kept within reasonable bounds, and the character of the work for which they were employed was strictly defined, their employment was not uneconomic.—*From an article entitled "South African Railways and Harbours."*

Unemployment Relief

In order to alleviate unemployment arising from depressed world conditions, the Victorian Government approved during the past two years of certain relief funds being allocated for various railway works. The amount provided by the Government represented mainly the labour proportion of the cost of the works, the balance being provided by the Railways Commissioners. Since the inception of the scheme a total amount of approximately £1,235,000 has been expended on railway works for the relief of unemployment. The bulk of the expenditure is being incurred on work in the country, which includes improvements to the track and extensive regrading of lines.—*From an article entitled "Victorian Government Railways."*

A 15 per Cent. Wage Reduction

Negotiations with various groups of organised labour leading to further reductions in wages were carried on. The result of wage reductions is that, generally speaking, the organised employees are now on a 15 per cent. deduction from the standard rate basis. The reduction in rates of pay of the supervisory and executive staff averages somewhat higher than this, ranging upwards with the higher rated classes. Notwithstanding the drastic reductions in expenditures the operating efficiency of the Canadian National Railways has improved.—*From an article entitled "Canadian National Railways."*

Redundant Railwaymen

In view of the prevailing unemployment in the country, as a result of the general business depression, the Government is averse from swelling the ranks of the workless with some hundreds of discharged railwaymen, for which reason the railways are obliged to maintain in service an excessive number of men, who could easily be dispensed with.—*From an article entitled "The Argentine Railway Situation."*

A 10 per Cent. Improvements Fund

In recent years a certain number of improvements have already been authorised under the heading of the "10 per cent. Improvements Fund." These funds, of which there are three in number, under the auspices of the Federal Government and the Governments of the States of Rio de Janeiro and Minas Geraes, were inaugurated approximately seven years ago, being formed of the product of a 10 per cent. surcharge on all rates pertaining to traffic carried in the respective concession areas. This product has to be devoted to improvements and new works definitely sanctioned by the respective Governments, although the company is at liberty to submit its own syllabus for approval. —*From an article entitled "The Leopoldina Railway."*

A London Board not Recommended

There were proposals in the report to abolish the post of High Commissioner for Transport, to alter the constitution of the Railway Advisory Council, and to appoint a small board in London similar to the board of the Nyasaland Railway. Sir Philip Cunliffe-Lister says definitely that he has found local opinion to be strongly opposed to transferring the responsibility for the railway to a London board, and after full consideration he has come to the conclusion that Mr. Gibb's proposals in this regard are not practicable.—*From an article entitled "Gibb Report on East African Railways."*

Modern Equipment Makes Money

Foremost is the fact that much equipment is necessarily old and to decrease the proportion of old to new is the more difficult because of the comparative expense of such equipment. Herein, perhaps, lies the greatest handicap of all railways in combating other methods of transport which compete with entirely new and up-to-date mechanism. This is brought home when one reflects what the competitive and earning powers of railways would be if, by some miracle, all rolling stock, signal equipment and permanent way, &c., could be suddenly transformed into the best that is known to-day. The transformation would be a tremendous revelation and railways as a means of transport would again reign supreme and inviolate in their sphere. That there is efficiency of "input" cannot be denied, but the efficiency of "output" or what might be termed the "over-all commercial efficiency of operating," is a subject of research which we submit should be more carefully examined.—*From an article entitled "Buy New Equipment Now."*

Indian Railway Safety

Freedom from accident for which the railway administration or its servants could be held responsible has in recent years been a feature of the annual reports upon Indian railways. Take, for instance, that widespread 7,000-mile system, the North Western, where, in spite of

greatly reduced expenditure upon maintenance and operation, only 11 accidents of all kinds occurred during 1933-34, apart from minor or personal mishaps.—*From an article entitled "Safety of Travel in India."*

Quick Accounting on Colonial Railways

Apart from the difficulties of language and custom, Colonial railways are situated a long distance from their sources of supply, yet in one important concern known to the writer, a reliable statement of revenue and expenditure can be furnished within the month following the close of each working period. This can be accomplished only by close collaboration with the Crown Agents and diligent study and attention on the part of those engaged in the interesting and useful occupation of railway accounting.—*From an article entitled "The Aims and Achievements of Colonial Railway Accounting Departments."*

Travelling without Tickets

In common with other railways in India this line suffers regular and considerable loss on account of persons travelling without tickets or with short journey tickets, and although measures are taken to deter people from indulging in what has become an habitual nuisance, no effective remedy will be found for dealing with the problem until the offence is made cognisable under the Indian Railway Act.—*From an article entitled "Rohilkund and Kumaon Railway."*

Decentralising Executive Work

Approximately three years ago, a modified form of decentralisation of executive work was adopted, by the inauguration of a Divisional Traffic Office with headquarters at Campos. This Office is in reality a combination of two of the original Traffic Inspection Offices, plus a portion of a third, and is in charge of a Head Office Representative, who has limited jurisdiction over more than 800 km. of line with regard to train movement and wagon distribution, staff and claims matters, and stores.—*From an article entitled "The Leopoldina Railway."*

Moving a Railway Headquarters

In order that the railway may be in a better position to deal expeditiously and efficiently with this growing traffic, arrangements have been made to transfer the railway headquarters from Sekondi to Takoradi. Sekondi, which is situated six miles from Takoradi, was until 1928 the railway terminus; but with the opening of the deep water harbour the main activities of the railway have moved to Takoradi. There is no disadvantage in having the workshops situated some distance from the sea, as the excessive humidity has a deleterious effect on machinery.—*From an article entitled "Gold Coast Government Railway."*

Job Analysis

In April, 1933, the new Organisation Branch of the North Western Railway administration was inaugurated in accordance with the recommendations of the Pope Economy Committee. This branch, working in co-operation with the divisions and other branches, operates as a research unit in matters affecting working expenses. Its chief function at present is the conduct of detailed investigations, generally known as job analysis, on systematic lines which eventually will cover the whole field of maintenance and operation. The specially selected officer in charge is designated Deputy Agent (Organisation) and was a member of the Pope Committee.

Up to March 31, 1934, the following ground was being covered by job analysis:—

Engineering: Track maintenance, analysis of labour; works organisation and staff. *Operating:* Running sheds, shunting analysis and marshalling yard staff and also station staff. *Clerical:* headquarters and divisional offices, Controller of Stores and stores audit offices. *Workshops:* Analysis of staff, special processes and use of scrap material. *General Stores depots:* Analysis of work in five main depots.

The savings recommended totalled Rs. 27 lakhs a year, and those accepted Rs. 20 lakhs, while the savings already affected totalled Rs. 9½ lakhs a year. Time lag accounts for the difference between the first two.—*From an article entitled "North Western (State) Railway, India."*

Pooling Economies in Canada

Results so far accomplished are evidenced in the pooling of passenger train services between Montreal and Toronto, Montreal and Quebec and Ottawa and Toronto. Other economies have resulted from arrangements for joint operations such as switching, car cleaning and freight shed operation at a number of points where duplication existed, as well as the hauling of traffic by one railway for the other. Many similar projects are under study, which, it is anticipated, will result in mutual benefits to both companies.—*From an article entitled "Canadian National Railways."*

Effects of an Earthquake

On January 15 of this year, an earthquake, the most severe that has been recorded in this country, caused serious and extensive damage to parts of the system, chiefly in North Behar, on the State portion of the line. Although little damage was done to rolling stock and no trains were derailed or capsized, which would have caused serious loss of life, the number of culverts and bridges, large and small, seriously damaged or destroyed was 361. On about 900 miles, or a little less than half the total system, hardly a mile of track was undisturbed. Embankments settled and in places disappeared entirely, the rails remaining suspended or being raised or shifted many feet laterally. Whole trains were marooned in some of the affected areas and could not be set in motion until the line and bridges had been repaired. This depleted the company's available rolling stock at a time when it was greatly needed.—*From an article entitled "Bengal & North Western Railway."*

Divisional v. Departmental Organisation

This system of organisation has now been replaced by a modified form of departmental organisation based on that in force on the Great Western Railway. The charts herein included show, in general terms, the former organisation and the new. The four largest of the British overseas railways (excluding the Dominions and India) are now operating under the Departmental System; *i.e.*, the Sudan Railways (2,021 miles), the Nigerian Railway (1,905 miles), the Kenya & Uganda Railways (1,627 miles), and the Tanganyika Railway (1,374 miles).—*From articles entitled "Nigerian Government Railways" and "Divisional or Departmental Organisation for Overseas Railways."*

Gold in the Gold Coast

As to the mineral wealth, the gold which acted as a lure to the Portuguese, the Dutch, and the British adventurer for centuries back, is again attracting the attention of enterprising prospectors; but in this year of grace the geologist, the trained mining engineer, and the specialist in metallurgy have replaced the "old-timer,"

and with the aid of roads and railways, which provide transport at a comparatively low cost, are adding their quota to the prosperity of the Colony. The principal gold mining areas now being exploited are Tarkwa, Abosso, Prestea, and Obuasi; but systematic and sound development is taking place also in areas served by roads feeding the railway at Insu, Dunkwa, Konongo, and Oda. On the Central Province line, near Wenchi, commercial diamonds are successfully exploited and exported to Europe.—*From an article entitled " Gold Coast Government Railway."*

Training Native Staff

In accordance with policy, many posts on the railway are being filled by men of African descent, and remarkable progress is shown by the following figures of native staff. Stationmasters, 100 per cent.; guards, 94·5 per cent.; locomotive drivers, 53 per cent. It will be realised that the work of training Africans is of very great importance and requires considerable organisation.—*From an article entitled " Nigerian Government Railway."*

Improved Publicity Methods

It has been considered good policy to continue and improve on publicity methods both with an eye to the existing conditions and the ultimate object of establishing in the minds of possible travellers, sportsmen and tourists, the Sudan as a country to visit. In this connection a series of coloured posters, depicting native types, has been issued, and attractive illustrated booklets in English and German have been published, together with pamphlets, maps and postcards. It is the intention to improve and extend upon these yearly.—*From an article entitled " The Sudan Railways."*

Motor Tracti n Applied to Railway Operation

A feature of railway operation in Queensland worthy of notice is the progress made in the application of motor traction to railway traffic. The rail motor traffic miles run in that State have increased from 628,000 during the year 1929-30 to 1,564,800 during 1933-34 and now represent 14 per cent. of the total traffic train miles.—*From an article entitled " Rail Motor Operation in Queensland."*

Popularity of Rail Motor Trains

A pleasing feature of the rail motor trains is that in every district where they have been installed they have become most popular with the travelling public, who have been enthusiastic in their appreciation of the quick, clean and comfortable transit provided. More particularly is this so on branch lines on which the passenger traffic has of necessity been catered for previously by mixed trains, due to the business being insufficient to warrant the provision of a steam passenger service.—*From an article entitled " Rail Motor Operation in Queensland."*

How Road Hauliers can Use the Railway

A new method of securing business against road competition was successfully tried between Wellington and Palmerston North (87 miles). This was to allow road carriers who could guarantee a minimum of ten 8-ton trucks weekly to hire trucks at a comparatively low rate for the carriage of general merchandise. The carriers are required to load and unload the trucks, the department having no responsibility in regard to checking at either end of the run. The system has effectively eliminated road competition, and the department's net revenue from goods traffic has increased between these points. The system is now being tried out between other important centres.—*From an article entitled " New Zealand Government Railways."*

Meeting Motor Bus Competition

On the coaching side, the principal difficulty experienced in recent years has been from uncontrolled motor bus competition. This, however, has been successfully countered by the adoption of a more frequent and speedier train service with close-timed connections at junctions, in addition to which return ticket concession fares, available every day of the week, have been introduced.—*From an article entitled " Rohilkund and Kumaon Railway."*

Transport Regulation

One of the most important developments during the past twelve months from the Victorian Railways point of view, and one that must have far reaching effects on the transportation problems of the State, was the passage by Parliament of a Transport Regulation Act, and the appointment of a board to administer its provisions.—*From an article entitled " Victorian Government Railways."*

Co-ordinating Road-Rail Transport

By sponsoring co-ordination of road-rail transport under the railway administration, H.E.H. the Nizam's Government have shown that they are able and willing to deal with one of the major transportation problems of the present day. In 1932 a start was made with a fleet of 27 vehicles operating 2,300 bus miles a day, and the fleet has now been increased to 65 vehicles operating 5,200 bus miles a day. These services yield a return of about 8 per cent. per annum on capital, in addition they have proved successful in free competition with private services. H.E.H.'s Government's policy has been justified by frequent requests from the public and local authorities for extensions of their road services covering nearly 600 miles of road have firmly established themselves in popular favour owing to their regularity, fixed reasonable fares, comfort and reliability. Experimental parcels and goods services are being inaugurated, and the next question to be tackled will be through booking by road and rail.—*From an article entitled " His Exalted Highness The Nizam's State Railway."*

The Desert Aids the Railway

The Sudan Railways have the advantage, in the matter of competition by road transport, in that appreciable areas of desert lie between the productive areas and the coast. These desert areas present difficulties to motor transport and steps are being taken by Government to discourage attempts by more resourceful motor transport owners to overcome them.—*From an article entitled " The Sudan Railways."*

Farthing-a-Mile Fares Increase Traffic Receipts

The most astonishing feature of the report is the rise in the number of passengers carried from 2,300,000 in 1932-3 to over 5,000,000 in 1933-4. This was the result of a reduction in the fare to ¼d. a mile third class, and appears to have been obtained without any material increase in train mileage. The receipts only rose £20,000 and the average fare fell from 1s. 6d. to 9d. The General Manager remarks: " Apart from an encouraging travel, these reductions have enabled market produce to be very cheaply conveyed in bundles by third class passengers, and are probably doing a great deal to keep down the

cost of food to the African population of the large towns, during a period when their earning power is low."—*From an article entitled "Nigerian Government Railway."*

Halfpenny a Mile Fares

From September 1, 1934, third class fares throughout the greater part of the line have not exceeded one halfpenny a mile, and in certain districts short-distance fares are now as low as three-eighths of a penny a mile.—*From an article entitled "Gold Coast Government Railway."*

Quoting Flat Rates

The tendency has been to quote flat rates to cover wide areas, thereby assisting the crops grown in the more outlying parts of the country. When it has been inexpedient to introduce flat rates, efforts have been made towards the same end by the provision of maximum rates. In order to induce better loading of trucks and a consequent reduction in working costs, reduced rates have been extensively quoted in terms of wagon loads.—*From an article entitled "The Sudan Railways."*

Simplified Goods Rates

On the goods traffic side, a start has been made with containers, for furniture transport. A number of "flat" rates have been introduced, chiefly for traffic from ports; and in the case of refined sugar, a "universal" rate, based on average traffic for some years previous, by which the sum charged is dependent upon weight alone, irrespective of distance, has been instituted, and is working very satisfactorily to both railways and manufacturer. Study is now being made of a proposal for the wholesale simplification of the goods tariff.—*From an article entitled "Egyptian State Railways, Telegraphs and Telephones."*

Better Goods Services

In providing speed in transit and efficiency in eliminating trouble for its customers, the board has carried through an effective policy in its goods services. A good deal has already been done in cutting down day services and substituting night services therefor. This, taken in conjunction with collection and delivery services which the board has developed, provides, in general, a rapid and efficient goods service.—*From an article entitled "New Zealand Government Railways."*

Thermos-Tank-Wagons for Milk Traffic

The retention by the railway of the greater part of its milk traffic, as against the facilities and cheapness of road transport, has only been possible by the introduction from time to time of special rebates on wagon loads or important monthly or yearly tonnages. This measure had the desired effect in areas where paved roads had not penetrated, but the construction in 1932-33 of a concrete highway from the suburb of Temperley, which was already linked to Buenos Aires by a paved road, to Cañuelas (64 kilometres from the city), alongside the railway line, and through a district where there are numerous dairy farms, threatened the railway with an almost total loss of the milk traffic. Faced with the possibility that La Martona company might elect to transport its pasteurised milk in tank-lorries from Vicente Casanes to its bottling plant in Buenos Aires, the railway offered to provide Thermos-tank-wagons for the service. Apart from the economy of handling, the use of these vehicles represents a considerable saving in freights because of the elimination of the container (milk-can), chargeable at the same rate as its contents. La Martona company fell in with the proposal, and recently two of these Thermos-tank-wagons have been put into service, built by Thompson Bros., Bilston, Staffs, England, and others are under construction. Their design is as simple as can be devised. Upon the underframe of a 40-ton flat wagon, 34 ft. long, a covered vehicle has been constructed containing two 10-ton Thermos-tanks at each end, with a space between in which cream cans and butter boxes can be loaded to make up a total maximum load of 30 tons. The Thermos-tanks, of cylindrical shape with convex ends, are of stainless steel insulated with cork packing, and are provided with manholes for cleaning purposes, glass inspection windows, inlets for compressed air with the necessary gauges and fixed thermometers indicating the temperature of the milk.—*From an article entitled "Transport of Milk in Argentina."*

Improving Passenger Comfort

A steady improvement has been made in the standard of comfort provided for passengers. On the Limited (the express which provides the fastest transport between the principal cities of Auckland and Wellington) all sleeping-cars are of the "de luxe" type. Nothing has been spared in the design, construction, and fittings of these cars to provide restful comfort in travel.—*From an article entitled "New Zealand Government Railways."*

Faster Services for Business Purposes

Accelerated services have been scheduled for additional country lines. To meet the convenience of travellers and to allow of more time for business purposes, the amended timetables provide for later departures from the metropolis. With the exception of one of the Interstate expresses, the earliest departure of an important afternoon train is now 5.5 p.m., whilst the earliest of the morning departures is 7.45 a.m.—*From an article entitled "Victorian Government Railways."*

A Luxury Cruising Train

In order to encourage tourist travel a start has been made by running a luxury cruising train comprising Pullman, sleeping and bath cars, hairdressing saloon and writing-room, and a car equipped with radio and orchestra for dancing. Special excursion trains are run periodically also between Buenos Aires and important towns, and arrangements are in force whereby passengers can obtain through tickets, inclusive of hotel charges, to various pleasure and health resorts.—*From an article entitled "Buenos Ayres & Pacific Railway."*

Railway to be Laid Out for Diesel Traction

For six years various avenues likely to lead to economy in working had been explored, and he was able to announce that if a projected branch line from Dolores to Ajó were built, it would probably be the first to be laid out entirely for diesel traction, running sheds and watering stations being dispensed with. The importance of this project lies not so much in the Dolores-Ajó section, which is unattractive commercially, but may have to be undertaken under a concession, as in a proposed 15-mile extension to the Atlantic coast.—*From an article entitled "Diesel Traction in Argentina."*

Diesel-Electric Railcars

Owing to the sparsity of the population the running of frequent steam trains is out of the question, and cheaper and less cumbersome units are indicated. The comfort given to the passengers must be comparable with

that of the modern motorcar and indeed improved upon. With this end in view, the Western Railway is trying out three different types of diesel-electric railcars, with the ultimate aim of replacing the majority of the existing steam trains on all branch lines and of putting in as frequent a service of small units as traffic will warrant.—*From an article entitled "Buenos Ayres Western Railway."*

Haulage of Manganese Ore

In 1929 over half a million tons of manganese ore were railed and shipped, and while in recent years there has been a decline in the tonnage carried, the revival of trade has led to a substantial increase in the demand for manganese, and it is not improbable that in the near future all previous records will be broken. The manganese is hauled in train loads of 750 gross, in trucks of 25 tons capacity.—*From an article entitled "Gold Coast Government Railway."*

An Indian Wagon Problem

One of the greatest problems affecting the railway is the distribution and rapid movement of wagons for the sugar cane traffic. In 1928 there were 16, and in 1932, 19 large sugar factories on the system. Since then sugar production has grown rapidly, the number of factories in operation this year being 58, necessitating the running of about 2,000 more cane vehicles and wagons than were required in 1932. This rapid increase has caused a severe strain to be put on the company's rolling stock, and the administration is now finding itself called upon to decide what additional stock it will be necessary to provide to meet the increased demand. The season for cane is a short one, and although mill owners are advised in good time to distribute their requirements of railed cane over the whole of the crushing season instead of concentrating, as they do, on the last two or three months, when traffic in general goods is at its highest, few of them have taken the advice given them which has greatly accentuated the problem of knowing what additional wagons are required. Such wagons would lie idle and could not be utilised profitably during the remaining nine months of the year.—*From an article entitled "Bengal & North Western Railway."*

Transporting Nitrate in Bulk

For the first time in the history of the railway, nitrate has been transported in bulk. Previously it was conveyed in sacks containing 100 kg., the net down wagon load averaging 19·4 tons. Net wagon loads of bulk nitrate commenced at a little under 15·0 tons, but after several tests an arrangement was arrived at with the nitrate producers for a standardised load, due to which the railway now counts on an average of 19·0 tons, almost equal to that of sacked nitrate and without any expense having been incurred in modifying the rolling stock, except the replacing of doors on 300 wagons.—*From an article entitled "The Taltal Railway."*

Traffic Control and Organisation

The use of selective train-control telephones, which in 1926 were employed on 314 km. of line, has been considerably increased since that date. Additional stations were placed under the jurisdiction of the existing Barão de Mauá and Campos control offices, while new control offices at Rio Bonito and Itapemirim, with 148 and 254 km. of line, respectively, under their supervision, were installed, with the result that the total controlled area now amounts to 843 km. There is no need to stress the advantages possessed by this system, in enabling, at the height of the busy season, a heavy freight-train movement to be handled over long stretches of single line with expedition, as well as wagon distribution and the circulation of sugar-cane specials to be organised.—*From an article entitled "The Leopoldina Railway."*

Suburban Traffic

Even the passenger side of transportation has become a problem of increasing severity, especially when it is realised that for an average distance of 7¼ miles the average fare on the suburban trains is equivalent to 0·84d., and that, numerically speaking, suburban traffic represents approximately 89 per cent. of the Leopoldina's passenger carryings.—*From an article entitled "The Leopoldina Railway."*

Welded Track

Further progress has been made in track improvement in the metropolitan area by an extension of the welding of 45-ft., 100 and 110-lb. rails to lengths of 225 ft. The Thermit process has been adopted and to date the total length of track so welded is 36 miles. In addition, 3¼ miles of track welded by the electric arc and Lindeweld processes have been installed for experimental purposes.—*From an article entitled "Victorian Government Railways."*

Prolonging the Life of Track Material

Unavoidable postponement of renewals has made it necessary to adopt special measures to prolong the life of the old track material. It was found that fishplates produced in the company's workshops under the drop stamps and given a considerable camber to take up the wear could be used with the old rails with excellent result. The railway is now installing additional drop stamps in order to increase the output of fishplates and joint supports. In addition to taking up the wear, these stamped fishplates are so designed that they enable the sleepers at the joint of the rail to be placed closer together, thereby giving better support, and for this reason the stamped fishplates have been found to be superior to the tapered shims, which have been used much less widely.—*From an article entitled "The Cordoba Central Railway."*

Prolonging the Life of Sleepers

The life of the sleepers has been prolonged considerably by the use of a device invented and patented by an employee in the Engineering Department. This consists of a shim, or supplement, used with the dog-spikes when redriven, to avoid boring a new hole. The shim is so contrived that it is drawn into the hole as the spike is driven in, producing a tight fit.—*From an article entitled "The Cordoba Central Railway."*

Track Maintenance—Change of Method

Prior to the year 1930, track maintenance was effected by small permanent gangs stationed at close intervals all over the system, pump trolleys being the standard method of transport from gang headquarters to the work on hand. The crisis forced the taking of drastic measures to reduce to a minimum the number of men engaged on the track, resulting in practically all the permanent way huts being abolished and much larger gangs established to work under the orders of the highest class of track foremen, and to facilitate the movement of men, &c., internal combustion motor trolleys have been provided. The careful pre-

arranged programming of the work to be done and the much improved supervision and mobility due to the use of the motor trolleys has revolutionised the methods of carrying out track maintenance work which were the common practice so few years ago.—*From an article entitled "Buenos Ayres Western Railway."*

Reducing Earth Ballasted Track

The urgent necessity for reducing the total extent of earth ballasted track, which is not only provocative of discomfort to passengers but also places a restriction on speed with safety, has induced the company to push ahead with its stone ballasting programme, and such progress has been made that 110 kilometres of the main littoral line between Visconde de Itaborahy and Macahé are now macadamised.—*From an article entitled "The Leopoldina Railway."*

Tube Welding Prevents Tube Failures

All main line passenger and several heavy goods type locomotives have their tubes electrically welded to the tube plate. Some years ago tube failures gave a great deal of trouble, but thanks to tube welding these have been practically eliminated; in fact, one locomotive ran 150,000 kilometres between shoppings without having the tubes touched. Welding of steel fireboxes has also had special attention. — *From an article entitled "Cordoba Central Railway."*

Bad Water and Engine Failures

New workshops with dual gauge approaches have been brought into use at Haifa, in place of the old main workshops there, and of the sub-shops at El Kantara East, which had been constructed by the military authorities. The locomotive position will not, however, be entirely satisfactory until the new water-supply planned for the town of Haifa is made available. Engine failures are still frequent in consequence of bad water and time-keeping is often unsatisfactory.—*From an article entitled "Palestine Railways."*

A Locomotive Programme

An indent for eight new locomotives has been placed for delivery this year and twelve more have been provided for in the programme for 1935-36. Estimates have been prepared for constructing a chord line between Chakia and Sidhwalia across the Gundak river, a project which is an urgent necessity not only to facilitate handling of traffic between Behar and the west but also to relieve dense congestion on the main line bottle-neck between Hajipur and Chupra.—*From an article entitled "Bengal & North Western Railway."*

New Method of Cleaning Running Gear

The second illustration shows a boshing tank, in which the engine is immersed for cleaning purposes to a sufficient depth to permit all running gear being covered by the caustic soda solution. The engine is put in overnight and the tank heated by steam blown down from an adjacent test boiler. On the following morning the locomotive is lifted out and thoroughly washed down with hoses. It is found that frames, &c., are sufficiently clean to enable the engine to go straight to the pit after being lifted off its wheels. Previously, frames could not be cleaned until the engine had been lifted, and valuable time is therefore saved. Certain parts require reboshing, as do all boiler mountings. These parts are loaded into and dipped in the tray shown in the left foreground.—*From an article entitled "Accelerating Locomotive Repairs, F.M.S. Railways."*

Dynamometer Car proves Useful

Full advantage is being taken of a dynamometer car jointly owned by the South Australian and Victorian Railways in studying the performances of locomotives under varied conditions.—*From an article entitled "Victorian Government Railways."*

Reducing the Pressure Drop between Boiler and Steam Chest

Following on an investigation of the performance of C class 2-8-0 goods locomotives, tests of successive steps to increase their horsepower and efficiency have resulted in appreciable improvements. The first alteration to the original locomotives was the fitting of a self-cleaning type of smokebox. This had the effect of improving the steaming capabilities and at the same time prevented the accumulation of ashes in the smokebox. The height of the blast pipe was reduced and its diameter increased while the chimney was also increased in diameter. In addition $1\frac{3}{8}$-in. elements were replaced by $1\frac{1}{2}$-in., and the disposition of superheating surfaces was modified. The reduction in pressure drop between boiler and steam chest and the drop in back pressure have combined to raise the horsepower by amounts ranging up to a maximum of 23 per cent. at 36 m.p.h. The engine running schedules on a typical trip, Melbourne-Bendigo (100 miles), have been reduced by 42 minutes in the down and 51 minutes in the up direction. Similar principles are now being applied on A2 class passenger locomotives with very promising results.—*From an article entitled "Victorian Government Railways."*

Casting of Bronze Liners and Bearings in Steel Axleboxes

The majority of the locomotive stock on the Kenya & Uganda Railways and Harbours Administration is fitted with steel axleboxes, having renewable bronze bearings and face and side liners also of bronze. Users of this type of axlebox are familiar with the difficulty of maintaining the brasses and liners tight for any length of time. Furthermore, the fitting and machining operations entailed are both lengthy and costly. In order to overcome these objections trials have been carried out in Nairobi shops involving the chill casting of the bronze bearings and liners in position in the axleboxes. A considerable number of axleboxes has been treated in this manner and are now under engines. The resulting saving in machining and fitting time, coupled with increased efficiency of the work, are such that arrangements are now being made to turn over to the new system entirely.—*From an article entitled "Kenya & Uganda Railways and Harbours."*

Effect of a Water Treating Plant

At one of the principal running sheds a water treating plant has been installed which treats 500 tons of water a day. Previous to the advent of this plant, tube and stay leakage was very prolific, and the cracks which developed in the firebox sheets were alarmingly numerous. The treating plant has been the panacea for all these evils and to-day the company is free from such difficulties. As a consequence of the benefits thereby derived, the number of locomotives allocated to this depot was reduced by 40 per cent. The tubes changed have been reduced by 82 per cent. and the staff has been cut down. The bad quality of the water employed for locomotive purposes

may be gauged from the fact that previously it was necessary to take the engines out of service after 9,000 miles had been run and withdraw all the tubes for the purpose of removing the deposit of incrustation; this practice is no longer necessary, and locomotives have completed over 62,000 miles without the removal of a tube! —*From an article entitled " Cordoba Central Railway."*

The Use of Wood Fuel

One of the economy measures introduced in recent years was the substitution of coal by wood-fuel, with the result that, at the present time, the burning of the former is virtually limited to the tank engines working the suburban trains and to the Petropolis and Friburgo " serra " locomotives, and also to one or two areas where either suitable firewood is unobtainable or the engines employed render the use of coal imperative.—*From an article entitled " The Leopoldina Railway."*

Spray Painting

Spray painting for steel wagons has been introduced but the economy achieved thereby is less than in England owing to the lower labour rates ruling in the Sudan.—*From an article entitled " The Sudan Railways."*

Ball Bearings Improve Passenger Services

The installation of ball bearings in the passenger rolling stock has been an important phase of the endeavours that have been made to improve passenger services. With the ordinary type of axlebox, hot boxes are liable to occur, notwithstanding that a high standard of care may be exercised in their maintenance. The inconvenience of delay and disturbance of passengers when a hot box occurs on a passenger vehicle is a serious matter, and one that the board has been most anxious to avoid.—*From an article entitled " New Zealand Government Railways."*

Vacuum Brake Fitted Goods Wagons

Turning to important and interesting developments in relation to the working and progress of the railway, one may mention, first of all, the fitting of 150-200 goods vehicles with automatic vacuum brake in the course of the last 12 months. At present, a number of these vehicles are being concentrated on the Itapemirim-Victoria stretch, over which a heavy coffee traffic is operated at the height of the season, and where, hitherto, the severe gradients combined with limitation of axle load on the track, have necessitated the working of numerous lightly loaded trains daily.—*From an article entitled " The Leopoldina Railway."*

Automatic Couplers Effect Economies

Steady progress has been maintained in the programme drawn up for the conversion of rolling stock to automatic couplers. To date 33 per cent. of the 622 locomotives and 68 per cent. of the 20,702 trucks have been equipped, and a commencement has been made with the application to country cars. The advantages of this modern equipment from the operating point of view have already been demonstrated in a spectacular manner by the increased train loads that the couplers have made possible. The previous load limit corresponded with a tractive power of 45,000 lb., but as much as twice the restricted load under the old draw-gear limitations has since been hauled on a double-headed train equipped with automatic couplers. In addition, the vehicular limitation is virtually abolished when sufficient auto-coupled vehicles are marshalled in the leading portion of trains.—*From an article entitled " Victorian Government Railways."*

Masonite for Bodywork

A year ago the bodywork both inside and out of a saloon was constructed with Masonite as an experiment. The results were so satisfactory that the same construction is now being followed in the case of two sleeping cars.—*From an article entitled " The Sudan Railways."*

New Egyptian Railway Workshops

The Locomotive Department has put the new locomotive workshops into use. These shops, designed and equipped on the most modern lines for " progressive " repair work, are situated in the desert about 15 miles from Cairo. At present most of the workmen are taken in and out by train, but the full scheme envisages a model township. The shops are electrically operated, from an 800 kilowatt power installation, which, in addition to operating and lighting the shops, provides the power for the recently inaugurated State Broadcasting Service. —*From an article on the " Egyptian State Railways."*

Research Assistant to the C.M.E.

An interesting section of the report deals with the appointment of the Research Assistant to the Chief Mechanical Engineer, and some of his work will be of value not only in Nigeria but on other colonial railways. Dealing with job analysis, the General Manager writes: " The outstanding success of the ' job analysis ' policy of the London Midland & Scottish Railway, and its adoption by the Indian railways, show clearly that routine staff have not the time fully to analyse detail or to follow up experimental work. If this is not someone's special duty it is not done, and important economies are missed. This is also very fully recognised by motor vehicle manufacturers. While the depleted staff of the railway will not allow of a full job analysis committee to investigate all departmental work and clerical activities, it is intended to do this from time to time under the chairmanship of the Principal Assistant to the General Manager."—*From an article entitled " Nigerian Government Railway."*

Welded Rolling Stock in Poland.

Welded rolling stock construction in Poland was the subject of a paper read by Mr. A. Brandt before the International Congress for Steel Development in London last June, and to which we made a general reference in our issue of July 13. Stress was laid by the author on details in the design and construction of wheels and axles calculated to save weight. The favourable results in carriage wheels, especially those of railcars in Germany, by means of tubular axles and light elastic wheels, led Mr. Brandt to anticipate equal success in the construction of wagon wheels. At present, however, the cost of constructing this new type of light wheel is more than double that of the old type, which makes it more likely that the new design will be adopted rather in passenger than in goods vehicles, wherein the proportion of the cost of wheel construction to the total is so much higher. Builders of railway rolling stock in Poland are, therefore, applying themselves more particularly to the problem of producing lighter wheels without greater cost, and are expecting to find the solution in electric-arc welding. In one pattern already constructed, the centre of the wagon wheel is composed of two pressed plates joined together by welding on to a ring made of bent flats, incorporating a tubular hub for mounting on a hollow axle. This class of wheel underwent all the tests officially prescribed with good results, the weight being 200 kg. less than that of the wheel at present used.

IMPRESSIONS OF OVERSEAS TRANSPORT

II—Science and luxury on the "Empress of Britain," and first impressions of Canadian railway travel

By A. W. ARTHURTON, formerly Secretary, British Railways Press Bureau

FROM the day on which, more than four years ago, I visited Clydebank during the Institute of Transport Congress at Glasgow to inspect the *Empress of Britain*, then under construction, I have always wished to travel on this famous ship, and it was perhaps not inappropriate that the first stage of my Empire tour should have been made upon her. The *Empress of Britain* has considerably lowered the travel time between Europe and America. Built to do 24 knots, equivalent to about 28 land m.p.h., from her very first season she has done even better, and in August of last year lowered the record (from Cherbourg to Father Point, Quebec—the official timing points of Atlantic liners) to 4 days 7 hours 32 minutes, the quickest land to land crossing ever made by an Atlantic liner. The thousand-mile length of the St. Lawrence seaway shortens the ocean journey by two days, as it is 515 miles shorter from Southampton to Quebec than to New York. The *Empress of Britain*, I am told, has recently beaten the *Bremen* in carrying mails to America, and every effort is being made to retain this record.

A modern steamship is an amazing mechanism and combines within itself a house, a social centre, a forwarding agency and a factory. It is self-contained and generates all the power it needs, delivering that power with the utmost economy of effort at the exact point at which it is required. Nothing on a ship just happens, everything is by design. It is sometimes well for the passenger by sea—as well as by rail—to remember what makes the journey so easy and so comfortable; how the ship is warmed, ventilated, lighted and fed, why it is that one can select a meal and choice wines from a long menu and wine list, ride upstairs in a lift or switch on a bed lamp to read after going to bed. So silently and so efficiently are the unseen services working for one's comfort. One hears it a little in the rhythm of the engines which permeates the whole ship. Unseen ears, hands and brains are listening, watching, working and thinking for the passenger, and every device that human ingenuity has been able to perfect protects him on ship or train.

Some such thoughts as these cross the traveller's mind, particularly on a ship where only a thin sheet of steel separates him from the ocean. It is necessary, however, to travel upon a ship like the *Empress of Britain* to appreciate the wonder and magnificence of the huge floating hotel with its eight decks and eleven lounges and dining rooms, its Heath Robinson cocktail bar, its swimming pool and Turkish baths, its full-sized tennis court and its various gymnasia. It needs an additional journey below decks to realise fully "how the thing works." The single reduction geared turbines, driven by oil-fired boilers, that develop 60,000 h.p. and drive the four great propellers, are supplemented by diesel engines which operate the auxiliary engines and supply power, light and ventilation to the whole ship. The two pairs of propellers are made of solid bronze and are respectively 19 ft. 3 in. and 14 ft. in diameter. The larger two weigh over 25 tons and are among the largest ever cast.

The science of navigation has been greatly increased in recent years by many important discoveries and inventions, all of which find their place in the *Empress of Britain*. The gyroscopic compass—a polaric mystery—supplements the magnetic compass, the echo sounder sends its sound waves to the bed of the ocean to ascertain its depth, and to the sextant or "dead reckoning" can now be added the radio-reception method of finding the bearings of the ship. A tour through the kitchens and bakeries and the laundry explains the perfection of the feeding arrangements above stairs. Everything is cooked by electricity. Electric power also turns the ice-cream mixers, the dough-mixers, dish washers, potato peelers and other mechanical aids to large-scale housekeeping, and 220 miles of electric cable are used to convey this power. A bakery, confectioner's shop and butcher's shop are part of the kitchen establishment and a printer's shop prints the menus and programmes and the daily newspaper one finds put under the cabin door every morning.

On the first day out from Southampton the sea was very rough, and judging by the sparse attendance in the dining room there were few—even seasoned voyagers—who escaped sea-sickness. The log that day showed only 357 miles covered instead of the average 600 or so, a striking indication of the effect of rough seas. In spite of this, however, the morning of the fourth day found us passing through Belle Isle Straits with the ocean portion of the journey completed. The thousand miles sail up the St. Lawrence was a delight. For the greater part of the way the banks on either side were covered with maple trees in the height of their autumn beauty, the red and gold of which alternated with the dark green of the pines. Most of the C.P.R. steamers go up the river as far as Montreal, but the *Empress of Britain*, on account of her deeper draught, is not able to do this and lands her passengers at Quebec. This is done at Wolfe's Cone, where it is said Wolfe landed his men to attack the Heights of Abraham above. Here a modern landing stage, sheds and customs warehouses have been built and here the special trains of the C.P.R. wait for mails and passengers, which soon after arrival of the boat are on their way to Montreal and beyond.

This was my first experience of a Canadian train. The carriages, viewed from the low platform, looked immense, and were mounted on 6-wheel bogie trucks, and although Canadian trains have first class accommodation as well as third and colonist, everyone seems to travel during the day by parlour car, for which a supplement of a dollar or so, according to distance, is charged. These cars are most comfortable and fitted with lounge armchairs on each side of a central gangway. There are 13 or 14 of these revolving chairs down each side, and the traveller can face whichever way he wishes. The windows are large but for some reason, in half Canada and the United States, the blinds are lowered halfway, which in the daytime gives a rather depressing look to the inside of the coach. No smoking is allowed, but in a compartment fitted with wash-basins at the men's end of the coach there are leather-covered benches provided where one may sit and smoke.

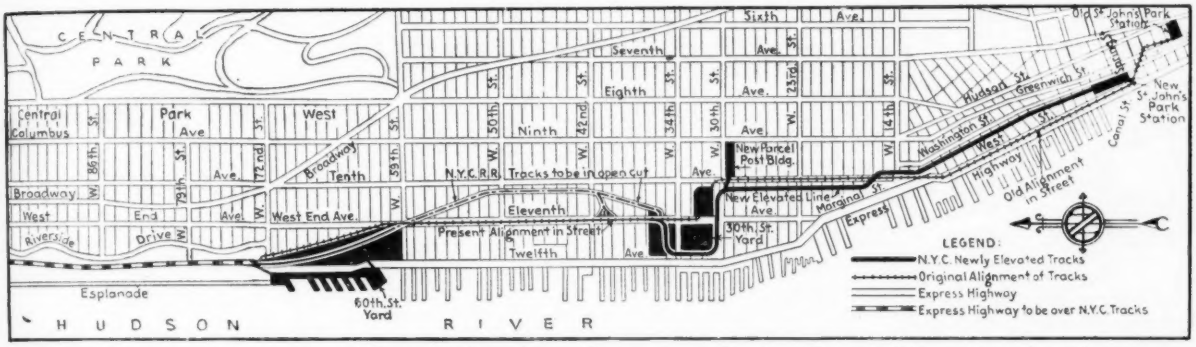
At the end of the train is a club car with lounge chairs and writing desks, where smoking is permitted, and forming part of the same car there is an observation platform with chairs. This platform is very pleasant in fine, warm weather, but we had no sooner taken our seats upon it than we were driven inside by a tunnel, the smoke in which penetrated the cars whenever a door was opened.

THE FREIGHT PROBLEM OF NEW YORK

Traffic on the only freight line serving Manhattan Island has hitherto been hampered by four miles of running through busy streets and many level crossings. The high and low level reconstruction now in progress is described in this article

IT is doubtful whether there is any city with a more difficult transport problem than New York. Not only is it the second largest city in the world but, in addition, it handles the greater part of the U.S.A. exports to Europe. These facts are imposing enough in themselves, but when American cities, hence it is not surprising to find that several new buildings have been constructed over the tracks, which pass right through them, often with sidings and private loading docks in the heart of the building.

The old terminus, at St. John's Park freight terminal,

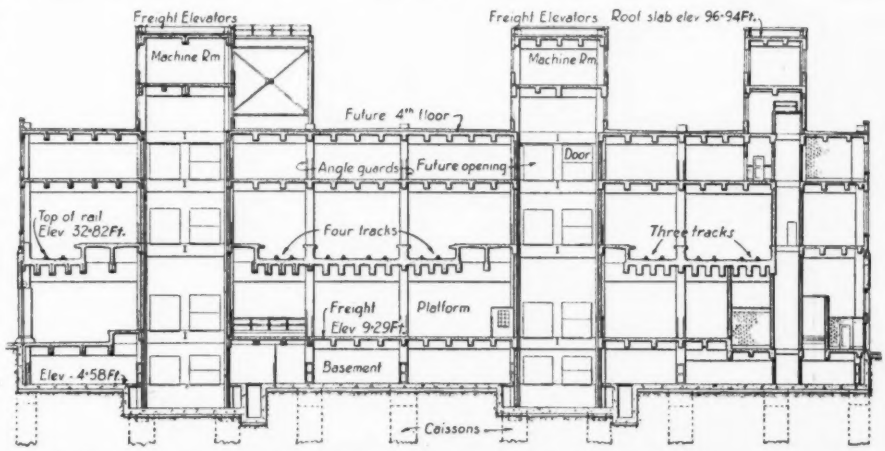


Plan of reconstruction work on West Side branch to relieve streets of rail traffic. A highway is to be built over the section on the extreme left, which is on the railway's own right of way

it is recalled that Greater New York is divided into four parts, two of them on islands, by wide rivers, the problem becomes more serious. As a last straw may be added the fact that there is only one freight line entering New York City, *i.e.*, Manhattan Island. This is the West Side branch of the New York Central Railroad, originally running for four miles of its length down the middle of the streets, where every train had to be preceded by a man with a red flag! All freight traffic from Long Island stops short at Brooklyn, and that from the west and south stops at New Jersey or Hoboken, whence the freight cars are ferried to the various piers on Manhattan Island. The problem thus divides itself into two parts: (*a*) increasing the capacity of the N.Y.C.R.R. tracks; (*b*) handling the freight across the rivers.

Dealing first with (*a*), the length of the West Side branch is 13 miles, of which the last 4 miles ran on the level down 11th and 10th Avenues and West Street. In its whole length the branch had 105 street crossings. Some five years ago an agrement was reached between the city and the railway whereby the rails were to be removed from the streets and placed partly on viaduct and partly in cutting, thereby freeing the streets from obstruction and the line from restrictions. In June, 1934, 2·3 miles of elevated track were opened for traffic together with a new freight station, whilst work is proceeding on a diversion and cutting for the remaining 1·7 miles of the old four-mile street section. Air rights are fully exploited in was at ground level; its successor has its tracks at viaduct level, some 25 ft. higher, with the ground floor as a large transfer dock, furnishing accommodation for 127 lorries to back up to the dock without projecting into the streets. The ground floor is divided by Houston Street, which passes through the building. Transfer of freight is effected by 14 lifts, with provision for 9 more as and when required. The building has been designed for extension up to 12 storeys but at present consists of only three storeys and a basement. Needless to say, it is equipped with all the latest devices for the easy and rapid handling of goods.

Problem (*b*) has also been taken in hand, and the first stage was completed with the opening of Union Inland Terminal No. 1 in 1932. Prior to this date each of the eleven trunk railways ferried its own cars to its own piers and left each consignee to do a round of the



Section through the new high-level goods terminus at St. John's Park. Trains are dealt with on the first floor

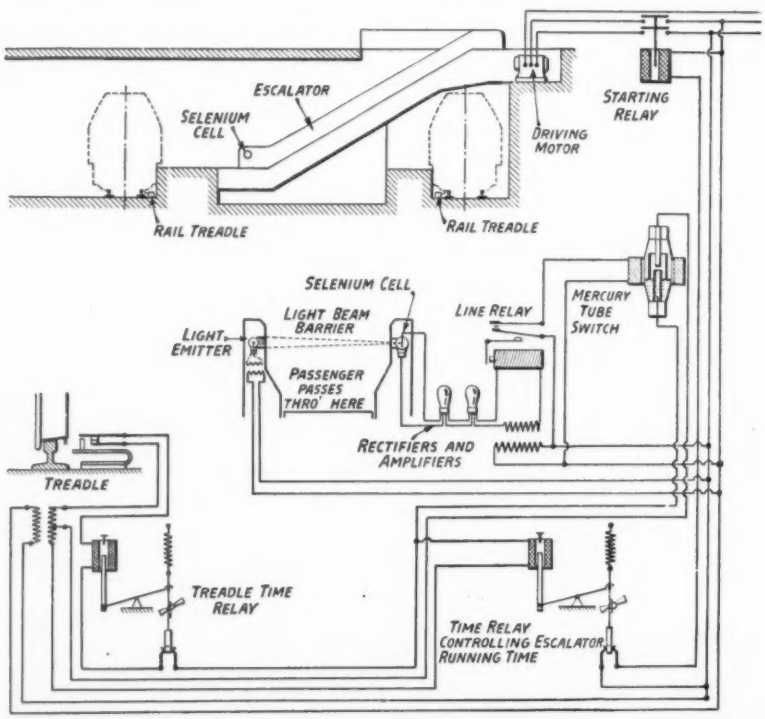
piers in order to pick up his day's deliveries. This led to a terrible congestion of the dock area, with consequent delay in delivery. By the formation of the Port of New York Authority it has been possible to co-ordinate all water-borne traffic. In addition to constructing those two masterpieces of bridge design—the Hudson River bridge, with 3,500 ft. clear span, and the Kill van Kull bridge, with 1,652 ft. span—this body has projected a new road tunnel and has completed the first of a chain of terminal buildings.

Union Inland Terminal No. 1 is unique in being the only railway goods station in existence with no railway tracks anywhere near it. In place of the present confusion an ordered method of delivery is being created. All goods will be sent to a consignee at the most convenient terminal, and, upon calling, he will find all his goods collected in one spot ready for loading up. To effect this, the freight cars are unloaded at the various marshalling yards on the far side of the river and the goods are loaded into road vehicles for the appropriate terminal and conveyed thence either by ferry or the Holland tunnel to be sorted out for the various consignees.

The terminal itself is a fine building architecturally and is admirably conceived. It consists of 15 storeys in all. The ends of the ground floor are occupied by offices and showrooms, with the remainder as space for lorries to back up to the loading dock. The basement and first floors are connected with the street by ramps. The basement is devoted to outbound, and the ground floor to inbound, "less than car loads," and are well equipped, including an elaborate system of ducts under the dock edges for the removal of petrol fumes. High-speed freight and passenger lifts connect all floors. Above the first floor is warehouse accommodation, complete with offices, mess rooms and similar facilities. Four large lifts with platforms 34 ft. × 16 ft. enable lorries to be taken to any floor. At each storey there is an unloading bay, where up to 8 lorries can back up to the dock and unload direct into the tenant's store. By means of roller doors isolating the bay from the lifts, each tenant is automatically provided with a lock-up garage for his lorries. The fire precautions are very complete and the whole scheme has been carried out with that inspiration and foresight so typically American. We are indebted to our American contemporary, the *Railway Age*, for the map and diagram which we reproduce.

ESCALATORS ON THE BERLIN STADTBAHN

In an editorial note in our issue of May 26, 1933, we referred to the automatic escalator control introduced on the Berlin Stadtbahn. It is reported that this arrangement continues to give satisfaction, both with the foot-contact and selenium cell methods of setting the escalator in motion. There are now seven escalators in service on the line, two each at Westkreuz and Schöneberg and one each at Alexanderplatz, Jannowitzbrücke and Innsbrücker Platz. That at Alexanderplatz is in constant use throughout the day. The public has taken a great liking to the escalators, and if they are out of service, for oiling or examination, impatience is soon expressed, although the distance covered is not great compared with the conditions on the London Underground. The simple control by the passenger passing on to the escalator has been used at Schöneberg (foot-contact) and Innsbrücker Platz (light beam) and the latter system was also put in at Westkreuz, but it was found advisable to modify it slightly, as the conditions did not allow of the construction of a long enough preliminary partition way between the foot of the escalator and the point where the light beam apparatus was required to stand. As the staircase is used primarily for exchange traffic between two levels, it was arranged to set the escalator in action by the approach of a train, through the operation of a rail-contact and a time-relay. The light beam apparatus is then used to prolong the holding effect of the time relay and cause the escalator to run until a few seconds after the last passenger has stepped off. The electrical connections of this scheme are given on the accompanying diagram. A few troubles were at first experienced with the adjustment of the treadles and the relay setting, but were soon overcome. A saving of current over the constant running system of from 23 to 27 per cent. has been obtained. Owing to increasing traffic it is found that there is now no saving to be gained at Innsbrücker Platz, and it has been decided to move the light beam control to another station where it will be of use. Five stations on the Elevated and Underground lines now have escalators and there will be ten sets on the new North-South line. An escalator is also to be installed, with light beam control, at Zoologischer Garten station of the Stadtbahn.



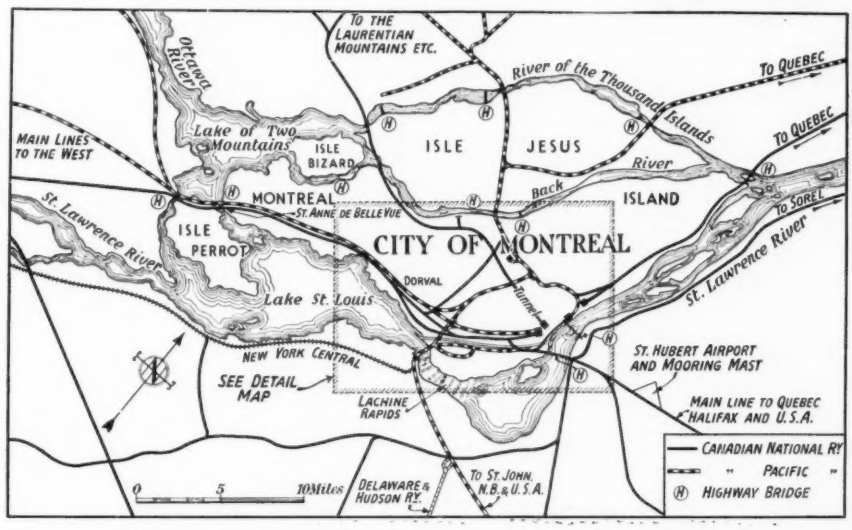
Electrical connections of train and light beam control for escalators at Westkreuz station, Berlin Stadtbahn

MONTREAL AND ITS RAILWAYS

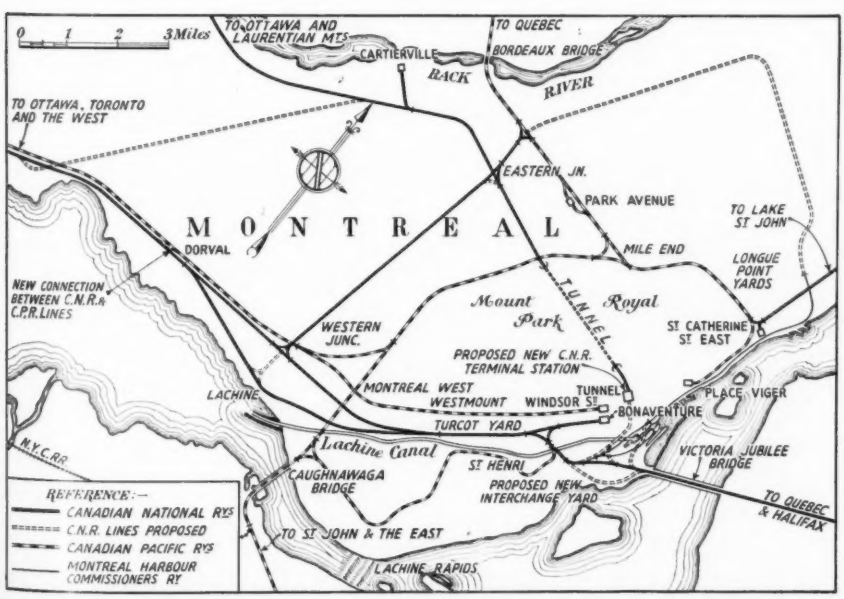
The first city of the Dominion of Canada is at present served by a railway system complicated by its insular position and by numerous disconnected lines

MONTREAL is situated on an island 32 miles long and 10 miles wide, the largest of a group occupying a position at the junction of the St. Lawrence and Ottawa rivers. On this island resides about one-tenth of the population of Canada, and its topography is responsible for the complicated railway system serving the city. For the approaches depend upon the bridges connecting the island with the mainland, of which there are only two across the St. Lawrence, the Victoria and Caughnawaga bridges, the former belonging to the C.N.R. and the latter to the C.P.R., and consequently all traffic with the south, south-east, and south-west has to cross one of these bridges. The Victoria bridge is $1\frac{3}{4}$ miles long and was opened by the Prince of Wales in 1869 as a tubular structure. Though the original piers remain, the spans are now composed of steel truss girders. The Caughnawaga bridge spans are deck trusses, except over the main channel, where there are bowstring girders. Its construction, about 1913, at the head of the Lachine Rapids, was a notable engineering work. Both bridges are so situated that all the approaches to the main city terminals are from the west, though carrying much traffic from the south and east.

There are two main terminal passenger stations, Windsor Street, C.P.R., and Bonaventure, C.N.R., which deal with the bulk of the traffic from all points of the compass. They are situated within a quarter of a mile of one another, and their approaches from the west run parallel and close to one another. Windsor Street, the head-



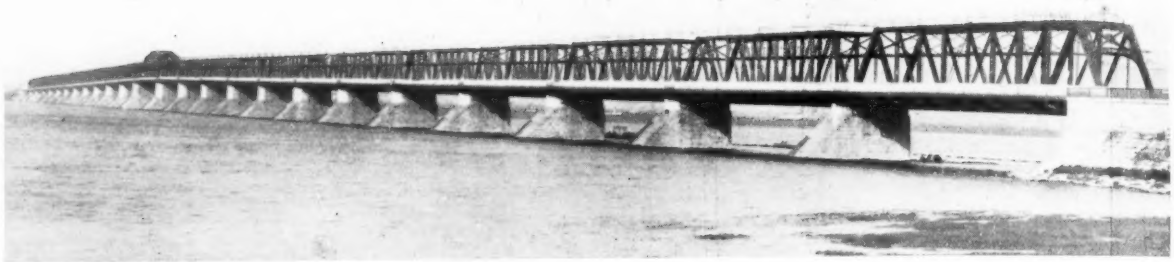
Map showing the approaches to the various stations in Montreal differentiating between C.P.R. and C.N.R. lines



Plan of Montreal city and its existing and proposed railways and stations

quarters of the C.P.R., has eleven platform tracks and deals with all C.P.R. passenger traffic with Ottawa, Toronto and the west, most of the Quebec expresses, specials to and from the Laurentian Mountains (to the north), all C.P.R. trains to the south-east and Maine coast, and also New York Central and Delaware and Hudson traffic. There are 33 trains incoming and as many outgoing on normal weekdays.

Bonaventure is the busiest passenger station in the city, but even so has normally only 36 incoming and outgoing trains daily. It has a very awkward approach through a busy industrial area at street level, with many level crossings. Also, trains to and from Victoria bridge describe two-thirds of a circle in leaving or approaching this station. Its principal traffic is with



The Victoria bridge of the Canadian National Railways across the St. Lawence at Montreal. The view is taken from the south side

Caughnawaga bridge, Canadian Pacific Railway, crossing the St. Lawrence at the head of the Lachine rapids

Five of the nine 100-ton, 2,400-volt electric locomotives recently supplied to the Harbour Commissioners' Railway, Montreal

Ottawa, Toronto and the west, eastern provinces, Quebec, Portland (Maine), Central Vermont, and other U.S. traffic, as well as local services south of the St. Lawrence —all except the first three via the Victoria bridge.

The main passenger trains from these two stations to Toronto, Ottawa, and Quebec have recently been combined into what is termed a " pool " service, as one item in a co-operative policy of operating economy arranged jointly by the two railway systems. Ottawa trains use, generally, the C.N.R. route; Quebec trains the C.P.R. route; and connections are made to the stations on the other lines as required. For the Toronto service, a new junction has been installed at Dorval (just west of Lachine) to enable the " pool " trains, using the C.N.R. line to Toronto, to enter and leave Windsor Street station, C.P.R.

The Smaller City Stations

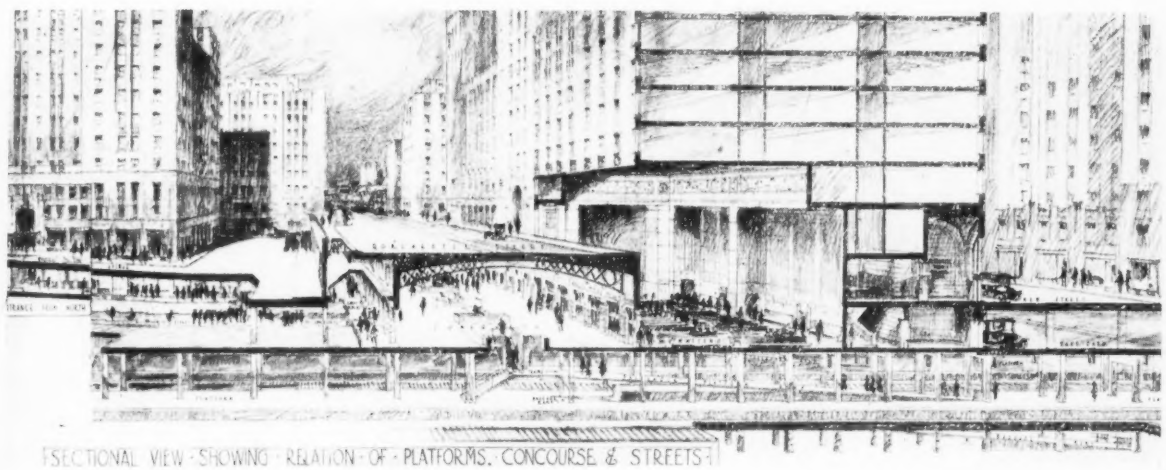
In addition the C.P.R. has passenger stations at Place Viger and Park Avenue. The former is on a spur from the harbour system of lines, and with its dozen trains daily in and out serves northern resorts, Quebec, &c. Park Avenue is a new station to the north of the city, and traffic from both Windsor Street and Place Viger converges upon it and passes on northwards via Bordeaux bridge.

The C.N.R., too, has subsidiary terminals at St. Catherine Street East and Tunnel. Trains from the former run to the Lake St. John area, Cochrane (Ontario) and the Rouyn branch. Tunnel station is approached from the north by a two-track, three-mile tunnel under Mount Royal. Main line traffic to the north is worked for four miles with electric locomotives, and local trains to St. Eustache are of the unit car type. No steam trains use this terminal. There is in addition McGill Street station, but, though electric express cars run out nearly 50 miles from it, it is in reality a tramway terminal.

Existing Defects Summarised

The main characteristics of the city's passenger traffic are therefore the large number of stations (mostly terminals) and the small number of trains using each. The latter is due in part to intensive street-car and road motor services and the vast number of private motorcars now used in Canada, which is far greater per head of population than in our British cities. But the principal reason for this defect will be found when the accompanying maps are studied in conjunction with the foregoing remarks upon the paralleling of the main lines and the duplication of local and main line services at so many terminals.

Considering the three main C.N.R. stations, for instance, it will be seen that for all practical purposes they are quite independent of one another, and the same condition is found when the C.N.R. freight yards are considered. The two main ones are the Turcot yards, to the west of Bonaventure station and the Longue Pointe yards near the St. Catherine Street East station. At present the transfer of freight cars from one yard to the other over C.N.R. metals involves a total journey of 108 miles. This figure may appear ridiculous, yet it represents an indisputable fact, the journey necessitating a detour off the island as far as Joliette on the north bank of the St. Lawrence. Physical connection between the two does, it is true, exist by way of the Harbour Commissioners' Railway, but as these lines are already taxed to their capacity, they cannot be regarded as a through route. They extend along nine miles of the harbour front, and were electrified during the years 1922-23.



Artist's drawing of proposed Montreal terminal, Canadian National Railways

Plans for Straightening Out the C.N.R. Problem

Plans for the complete co-ordination of all the disconnected C.N.R. lines serving the city and the terminal facilities had been under consideration for several years when the late Sir Frederick Palmer, M.Inst.C.E., was requested by the Dominion Government to report on the latest plans of the railway's engineering department. His report was favourable, and was followed (in June, 1929) by the passage of a special Act of Parliament authorising the work and providing $50,000,000 for construction. Unfortunately, due to trade depression, the work had to stop soon after its inception, when only major excavation work for the new passenger terminal and part of the approach viaduct had been completed. Excavation is practically complete over the whole area of the terminal and, although it has been neatly finished off, it yet remains a grave disfigurement to the central part of the city.

Details of the C.N.R. Plan

The main features of this great plan are indicated on the second of the accompanying maps. All passenger traffic is to be concentrated in a new terminal station, which, in view of the local topography, will be below the surrounding ground level, and will incorporate the existing

Left : General exterior view of Windsor Street station, Montreal, C.P.R.

Below : Entrance façade at Bonaventure station, C.N.R. The familiar tower of the C.P.R. Windsor Street station may be seen immediately behind

Right : Imposing frontage of new Park Avenue station to the north of the city on the line to Bordeaux bridge

Tunnel station. Traffic entering Tunnel station at present will continue to operate in the same way, but trains coming in over the Victoria bridge will follow a short new route leading directly to the terminal. Traffic entering from the west will be diverted to a new trans-island line at Pointe Clare, which is to connect with the present electrified lines from Tunnel station. A new connecting spur is to be added at Lachine, and a new interchange carriage yard and a harbour freight yard are planned at the end of the Victoria bridge. A connection is also to be made from the bridge to the Harbour Commissioners' Railway, which traverses most of the developed water front, and finally an entirely new "belt" line is to be constructed connecting the eastern lines into the city with the northern access lines to the new terminal and serving at the same time a rapidly developing residential district.

The completion of this scheme will see the end of many dangerous level crossings, and the project includes the electrification of all passenger train movements in the vicinity of the city. An unusual and interesting feature of the terminal scheme is that it was planned to produce a revenue from rentals and "air rights" on the area adjacent to the passenger terminal, which should, within a reasonable number of years, make the works self-supporting. The viaduct structure already constructed is being used for office and storage space, and the rentals of these, plus the saving made by the C.N.R. in its own office rents, are sufficient to cover the interest charges on the money already expended on the viaduct construction and the preliminary purchase of property.

The C.P.R. More Favourably Placed

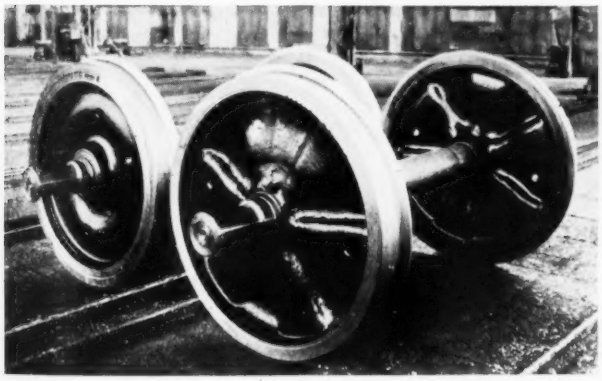
From this brief description it will be seen that the project is an immense one, but the circumstances which make it necessary are almost equally complicated, due to the fact that the C.N.R. represents the co-ordination of independent railway interests entering the city in different and independent ways. By way of contrast, the steady development of the C.P.R. services calls for few comments. The three main terminals are connected by the "belt" line already mentioned, on which are situated the extensive Angus shops and yard, and although the C.P.R. lines are naturally affected by the unusual topographical details of the island, it must be admitted that the lay-out that has been achieved is reasonably satisfactory.

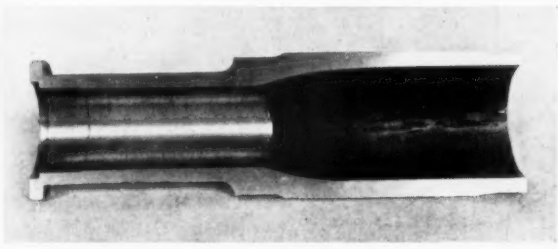
LIGHT WHEEL SETS

IN order to reduce the hammering effect of unsprung weight, which becomes specially prejudicial to the track where high-speed vehicles are concerned, the Bochumer Verein für Gussstahlfabrikation A.G., Bochum, and the Waggonfabrik A.G., Ürdingen, have collaborated in the production of light wheel sets applicable to all types of coaches. By the use of hollow-drawn axles of VCN.15 nickel-chrome steel a saving in weight of 57 per cent. is effected, compared with the axles of the German State Railway's standard C1 wheel sets. The mechanical properties of the chromium-nickel steel are: Tensile strength 70-80 kg. per sq. mm. (44·5-50·8 tons per sq. in.); yield point about 50 kg. per sq. mm. (31·8 tons per sq. in.); minimum elongation 17 per cent.

The wheel centres are of rolled and pressed steel with a double system of corrugation. In other words, the disc has an S-shaped section radially, and is also corrugated on any concentric section. This construction is claimed to be very elastic and, at the same time, to give a high carrying capacity notwithstanding the lightness of the disc.

The nave tapers towards the centre of the wheel set, thus reducing the axle stresses at the outer and especially at the inner end of the nave due to the pressing-on of the wheels. Normally, the tyres are shrunk on, but the centres and tyres can be rolled and pressed in one piece, the tyres being then oil-hardened to increase their durability. By the use of hollow axles and the new type of wheels, it is possible to effect from 25 to 40 per cent. saving in weight compared with ordinary wheel sets.





Left: Light coach wheel sets showing system of centre corrugation

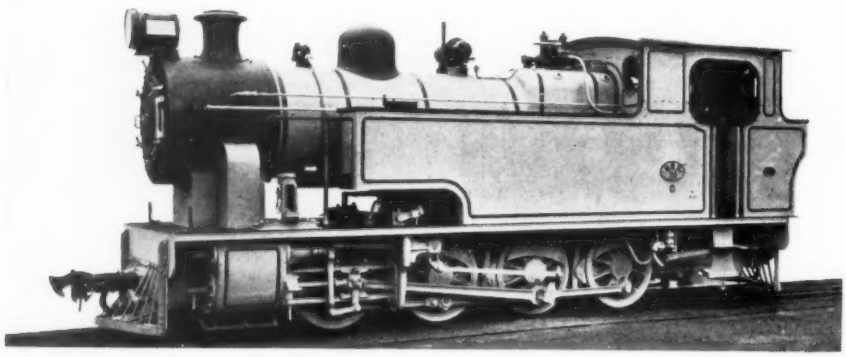
Above: Hollow-drawn VCN15 nickel-chrome axle in section

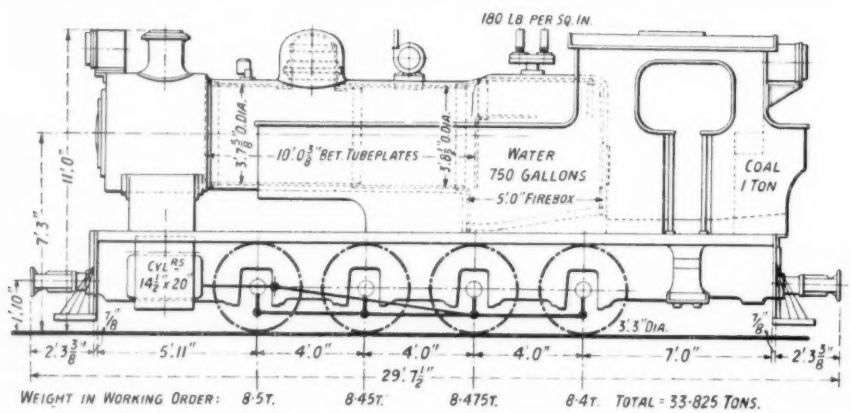
SLIP COACHES.—At the monthly meeting of the Railway Club, held at the headquarters, 57, Fetter Lane, E.C.4, on Friday, November 9, a paper was read by Mr. G. W. T. Daniel on "Slip Coaches Services, 1858 to Present Day." The lecturer remarked on the dearth of literature relating to slip coaches, and referred to all the slip coaches which had been operated by every railway in the British Isles. The peculiar working of the London & Blackwall Railway was mentioned, where the trains were rope-hauled and dropped a carriage at each station. The first authentic slip was on the Great Western at Slough in October, 1858, but cases of possible previous slips on other lines were cited. Mention was also made of four trains on the Great Western which slipped three times without a stop, of the nearest slips to London being made by the London, Chatham & Dover, which had up slips at Herne Hill and down slips at Beckenham, and of the longest slip journey after being slipped, which was from Stafford to Swansea on the London & North Western Railway. A discussion followed, and the lecturer was warmly thanked.

NEW METRE-GAUGE TANK LOCOMOTIVES FOR INDIA

An interesting 0-8-0 type built by W. G. Bagnall Limited, Stafford, for the Bhavnagar State Railways

WE reproduce herewith an outline dimensioned drawing and a photograph of one of two 0-8-0 tank locomotives recently constructed by W. G. Bagnall Limited, of Stafford, for the metre-gauge Bhavnagar State Railways. A very modern specification has been worked to in designing and building these locomotives, which have been introduced for shunting work involving the movement of heavy loads from the docks. They are fitted with the latest type of wide firebox above the frames, and the equipment includes Ross pop safety valves, Sunbeam electric light, boiler top-feed fittings, and Everlasting blow-off cocks.





New metr gauge 0-8-0 type locomotive for Bhavnagar State Railways

The engine develops a tractive force at 85 per cent. of the boiler pressure of 16,496 lb., the ratio of tractive force to adhesive weight being 4·6:1. The engine weighs in working order 34 tons.

The following are the leading particulars:—

Cylinder diam. ..	14½ in.
Piston stroke ..	20 in.
Wheels, diam. ..	3 ft. 3 in.
Wheelbase ..	12 ft. 0 in.
Boiler diam. outside at back ..	3 ft. 8½ in.
Boiler height of centre	7 ft. 3 in.
Working pressure	180 lb. per sq. in.
Heating surface—tubes	707·75 sq. ft.
Heating surface—firebox ..	65·25 sq. ft.
Heating surface—brick arch tubes	7·25 sq. ft.
Heating surface—total	780·25 sq. ft.
Grate area ..	15·5 sq. ft.
Water capacity of tanks	750 gal.
Coal capacity of bunker.. ..	1 ton

The following firms subcontracted for special material and fittings for the two locomotives: Gunmetal axleboxes and other fittings, Billington & Newton Limited; laminated bearing springs, Thos. Turton & Sons Ltd.; buffers, A.B.C. Coupler & Engineering Co. Ltd.; tubes, Phœnix Steel Tube Co. Ltd.; injectors, Gresham & Craven Ltd.; vacuum brake, Vacuum Brake Co. Ltd.; lubricators, C. C. Wakefield & Co. Ltd.; asbestos mattresses, J. W. Roberts Limited.

AUTOMATIC BRAKING FOR FREIGHT TRAINS.—The Westinghouse Brake & Saxby Signal Co. Ltd. is supplying automatic brake equipment to the Polish State Railways for application to freight locomotives and wagons, the order for which, valued at £4,771,892, was announced in our issue of April 7 last. The apparatus is tested and approved by the International Union of Railways for the braking of empty and loaded wagons or coaches and for plain or mountain service. A fully illustrated booklet, with large-scale folding diagrams, describing the system and its adaptation to the Polish State Railways wagons has been published by the manufacturers. Although the brake as fitted to locomotives and coaches is not included in this description, the simple alteration necessary for the conversion to passenger operation is briefly referred to. The only difference involved is the provision of additional passages to and from the brake cylinder in order to accelerate application and release.

RAILWAY NEWS SECTION

PERSONAL

Mr. J. S. Ramsden, M.I.E.E., who, as announced in THE RAILWAY GAZETTE of November 23, has been appointed a Director of the British Thomson-Houston Co. Ltd., is Industrial Sales Manager of that firm. He gained his early experience with Dobson and Barlow of Bolton, and then spent three years with the British Westinghouse Company at Trafford Park. The next 2½ years saw him in the service of Vickers Limited in the Electrical Department. It was in 1910 that he joined the B.T.H. Company, but he was soon transferred to the commercial side, until in 1913 he returned to the Manchester office. Mr. Ramsden was appointed Manager of the Birmingham office in 1919. Four years later he returned to Rugby as Commercial Manager, a post which now also covers industrial sales. As well as Industrial Sales Manager, Mr. Ramsden became Manager of District Offices. Outside the B.T.H. Organisation he has done important work as a Member of the Electrical Fittings Statutory Committee since its formation in 1927, and as a member of various committees of the B.E.A.M.A.

Mr. F. Samuelson, M.I.Mech.E., M.I.E.E., who, as announced in our last week's issue, has been appointed a Director of the British Thomson-Houston Co., Ltd., is Engineer and Manager of the turbine shops, and has been with the firm for over 37 years. He has been in charge of the company's turbine design and manufacture since 1903, prior to which date he was working with Sir Hiram Maxim on his quick-firing gun and his flying machine. The Institution of Mechanical Engineers has shown its appreciation of Mr. Samuelson by choosing him as a Member of its Council and as Chairman of its Midland Section. Just over two years ago the King of Sweden conferred on Mr. Samuelson the Royal Order of Nordstiernan.

Mr. C. E. Spurgeon, M.I.Mech.E., who, as announced in THE RAILWAY GAZETTE of November 9, has been

Mr. C. E. Spurgeon, M.I.Mech.E.

Appointed Chief Mechanical Engineer, Egyptian State Railways

appointed Chief Mechanical Engineer, Egyptian State Railways, was born in 1879. His early locomotive experience was gained at Swindon, G.W.R., and University College, London. In 1904 he was appointed an Assistant Locomotive Superintendent on the Indian North Western Railway. He was promoted to District Locomotive Superintendent in 1911 and, after varied experience in the design and layout and construction of locomotive repair shops, oil fuel fired locomotives and in charge of various districts, was promoted to officiate as Deputy Chief Mechanical Engineer. In 1922 he was put in charge of the workshops and later was appointed Superintendent Mechanical Workshops, N.W.Rly. In 1928 Mr. Spurgeon was appointed to officiate as Chief Mechanical Engineer of that railway, was confirmed in this post in 1929 and retired from service in India with this rank in May, 1934.

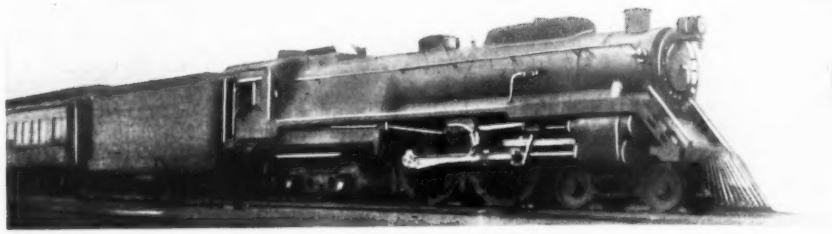
The Minister of Transport has appointed Mr. James J. Hughes for the remaining period of three years from February 1, 1934, as a member, representative of trading interests, of the Transport Advisory Council established under the Road and Rail Traffic Act, 1933, to fill the vacancy caused by the resignation of Sir A. Steven Bilsland, Bart. Mr. Hughes is Chairman of the Traders' Co-ordinating Committee on Railway Rates and Vice-Chairman of the Traders' Co-ordinating Committee on Dock Charges.

Señor Eduardo Alfonso, who, as announced in THE RAILWAY GAZETTE of October 19, has been appointed General Manager of the Madrid, Saragossa and Alicante Railway (M.Z.A.), is 54 years of age. He joined the Traffic Department of the railway, and was subsequently appointed a Divisional Engineer. In 1909 he was promoted to be Chief Engineer to the Traffic Department, a position often found on Continental railways. In 1913 he was attached to the General Manager's Department, becoming Assistant General Manager in 1920 and Deputy General Manager in 1926. He is succeeded as Deputy General

Photo] [Swaine

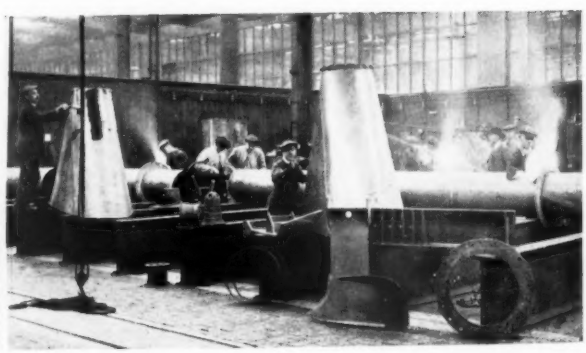
The thirteenth annual officers' reunion dinner of the Royal Engineers, Railway Operating Division

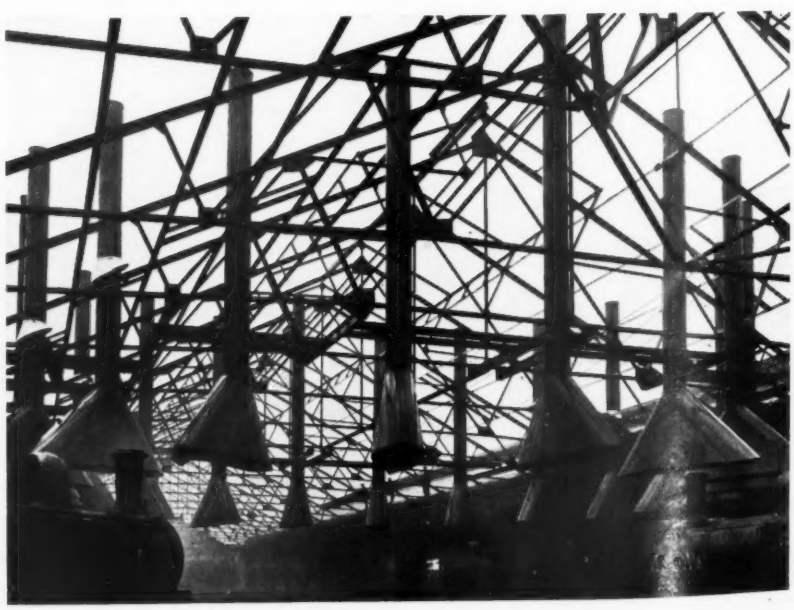
(*See report on page* 905)



Baltimore & Ohio class J-1, 4-4-4-type, locomotive No. 1, just turned out of the Mt. Clare shops and specially designed for high-speed work. (*See editorial note on page 879*)

Left: Northern Pacific class A, 4-8-4 type, locomotive No. 2650, one of ten now in course of delivery from the Baldwin Locomotive Works, and referred to in our editorial note on page 879





Above and right: The fabrication by electric welding and erection of 40 smoke stacks, at Dairycoates locomotive shed, Hull, L.N.E.R. The stacks are of $\frac{1}{8}$-in. m.s. plate, welded with No. 12 m.s. electrodes. Though 19 ft. long, 1 ft. 8 in. in diameter, and with a bell mouth 8 ft. 6 in. × 3 ft., these stacks each weigh only 7$\frac{1}{2}$ cwt.

Manager by Señor Don Emilio Santiago, who rose through the various grades of the Locomotive Department to become Assistant Locomotive Engineer, prior to his being attached to the General Manager's Department.

The Hon. Evelyn Hubbard, a Director of the late Metropolitan Railway, left estate valued at £45,015 (£43,816 net).

SOUTHERN RAILWAY STAFF CHANGES

Consequent upon the death of Mr. G. H. Wheeler, the following appointments in the Traffic Manager's Department are announced, to date from November 1:—

Mr. A. H. Lingard to be Commercial Assistant.

Mr. W. M. Perts to be Deputy Commercial Assistant.

Mr. A. E. Hammett to be Assistant for Rates and Fares.

Mr. A. B. Potter to be Assistant for Road Transport.

With effect from December 31, Mr. C. C. Verrinder retires from the position of Agent General in France for the British Railways. He will be succeeded on January 1, 1935, by Mr. H. C. King-Stephens, at present General Agent for the Southern Railway in Belgium and Germany. In consequence of this change the following Southern Railway Continental Agency appointments are announced, with effect from January 1:—

Mr. A. M. Newbold to be Agent in Brussels.

Mr. J. D. Ziesecke to be Agent in Cologne.

The new Egyptian Ministry, which was approved by H.M. King Fuad on November 15 last, includes the name of Abd El Meguid Omar Bey as Minister of Public Works and Communications. His Excellency the new Minister is well respected in all branches of Egyptian society, and is also well known in British circles. He is a capable civil engineer, and has held, amongst many other appointments, those of Principal of the Royal School of Engineering, and Director-General of Reservoirs in the Ministry of Public Works.

We regret to learn of the recent death, at the age of 64, of Herr Bruno Ritter von Enderes, a former head of a department of the Austrian Federal Railways. After completing his studies in Vienna he entered the railway service, and was employed on the construction of several lines in Austria-Hungary, subsequently holding charge of the building of the electric line between Male and Trento, in the then Austrian Trentino. In 1908 he went to the Aussig-Teplitz Company and eventually became General Manager. Becoming associated with the German Railway Association he took a great part in its work, and he was also the author of several authoritative works on railway transport and engineering.

INDIAN RAILWAY STAFF CHANGES

Mr. L. F. W. Nolan, Deputy Agent, A-B.R., returned from leave and took over charge of his duties from Mr. W. H. Prendergast on November 2.

Mr. P. Hackforth, Officiating Chief Engineer, E.I.R., has been confirmed in that appointment as from July 15, 1934.

Mr. G. Thomson, Officiating Chief Mechanical Engineer, E.B.R., has been granted leave for 4¾ months as from October 26.

Mr. G. C. Laughton, on return from leave, has been appointed to officiate as Senior Government Inspector of Railways, Circle No. 7, Bangalore, as from October 20, with the rank of Deputy Chief Engineer.

Mr. F. R. Hawkes, O.B.E., Chief Commercial Manager, N.W.R., has been granted leave for 3½ months as from November 2.

Mr. C. E. Long has been appointed to officiate as Superintendent of Stores, Burma Railways, as from October 9.

The R.O.D. Dinner

The Thirteenth Annual Officers' Reunion Dinner of the Royal Engineers (Railway Operating Division) was held on Friday, November 23, at the Trocadero Restaurant, London. Lt.-Col. Sir Cecil Paget, Bart., C.M.G., D.S.O., occupied the chair, and among those present were:—

Captain Amswych, Major F. W. Abraham, Mr. Ashton Davies, Captain G. S. Bellamy, Lt.-Col. V. M. Barrington Ward, Mr. S. Booth, Major W. A. Brown, Major W. P. Bradbury, Captain F. L. Castle, Captain C. S. Claxton, Captain A. B. Chester, Captain J. Clubley-Armstrong, Captain H. W. Crosthwait, Captain A. D. Cook, Major R. D. K. Curling, Sir Francis H. Dent, Captain E. C. Dewick, Major C. H. W. Edmonds, Major G. Flood Page, Lt.-Col. J. H. Follows, Captain C. Grasemann, Captain R. Horsfield, Captain B. H. Harper, Captain A. T. Haythornthwaite, Col. A. M. Henniker, Captain S. Hurst, Major A. P. Hunter, Mr. J. A. Kay, Captain W. R. Lamb, Lt.-Col. G. S. Lynde, Colonel D. M. Lyell, Major Loftus Allen, Brig.-Gen. Sir H. Osborne Mance, Lt.-Col. P. D. Michod, Lt.-Col. L. Manton, Major C. H. Montgomery, Major J. Haggie Patterson, Lt.-Col. Sir Cecil Paget, Bart., Mr. C. F. de Pury, Captain R. M. T. Richards, Major H. G. N. Read, Captain C. E. Rhodes, Captain M. D. Robinson, Colonel Harold Rudgard, Captain J. L. Rieter, Captain C. E. R. Sherrington, Lt.-Col. H. A. Short, Lt.-Col. K. R. N. Speir, Major H. G. Scot, Major E. M. Sinauer, Captain J. J. Patrick Sheridan, Lt.-Gen. Hon. Sir Richard M. Stuart Wortley, Colonel H. A. Stenning, Major R. Tandy, Lt.-Col. E. A. W. Turbett, Major H. G. Thynne, Colonel W. G. Tyrrell, Captain L. Trevor Jones, Captain L. H. Walsh, Captain W. C. Williams, Captain P. Way, Captain W. A. Willox, Captain T. Williams.

The chairman expressed the disappointment of those present that General Maurier could not be present, but he was glad to welcome Captain J. L. Rieter to represent our French allies. Captain Rieter, who was most cordially received, responded in an entertaining speech delivered in French with interlacings of English. He referred to the close co-operation which existed between the French Commission Regulatrice during the war and the R.O.D. In humorous vein he maintained that he still enjoyed close contact with the British nation, especially in suburban trains on foggy evenings. Equally his work at the French Embassy in dealing with every sort of query that might reach the Embassy led him, in attempting to reply, into deep researches into the work and activities of the Londoner, and his wartime experience in connection with the R.O.D. had proved most useful as a training ground to deal as tactfully as possible with questions concerning matters of which he had never heard before.

Lt.-Gen. the Hon. Sir Richard M. Stuart-Wortley, in proposing the toast of "The R.O.D.," referred to the splendid work performed in France by railwaymen, who had the advantage and pleasure denied to many sections of the industrial community of seeing the results of their work with their own eyes. In replying Major F. W. Abraham, after expressing pleasure at the tribute paid by General Stuart-Wortley, devoted the rest of his speech to reciting, with modifications, a well-known classical poem purporting to record the general behaviour of the R.O.D. in France.

Lt.-Col. V. M. Barrington-Ward proposed the toast of "The Visitors" and expressed the special pleasure of the members of the R.O.D. assembled in having with them Colonel Manton, who in France had the title of A.D.G.T., which, whatever its official meaning, was generally interpreted as Always Doing Good Turns; Colonel Follows, whom everyone was delighted to see looking thoroughly restored to health after his recent serious illness; Sir Francis Dent, the father, or perhaps more correctly the godfather, of the R.O.D.; and Mr. Ashton Davies.

Brig.-Gen. Sir H. Osborne Mance, in replying, expressed the pleasure of the visitors in being given the opportunity to celebrate the co-operation between temporary R.E. officers and regular, a co-operation which had been wholehearted and without any blemish. Colonel W. G. Tyrrell proposed the health of Captain R. M. T. Richards, the secretary of the dinner, who in reply referred to the gratifying increase in the numbers present at the dinner. Lt.-Col. G. S. Lynde, in a speech of reminiscences, proposed a vote of thanks to Sir Cecil Paget for presiding.

Royal Wedding Trains

Each of the railways has run special trains in connection with the Royal Wedding on November 29. The duty of conveying T.R.H. the Duke and Duchess of Kent from London to Birmingham after the ceremony fell to the Great Western Railway, which ran a special train from Paddington at 4.20 p.m. to Snow Hill, arriving at 6.20 p.m. The locomotive was No. 6000 *King George V*, with Inspector Sheldon of Swindon and Driver J. Duffin and Fireman J. Williams, both of Old Oak Common, on the footplate. The Duke and Duchess of Kent travelled in the special coupé saloon coach, *King George V*, one of eight built at Swindon and named after Members of the Royal Family. They were fully described in our issue of November 6, 1931.

This vehicle is 60 ft. long, 9 ft. 7 in. wide (the widest stock in use in the country) and has in addition to two other compartments, a coupé in which the Duke and Duchess travelled. The interior decoration, which was carried out by Trollope & Sons Limited, is in autumn tints, the various shades of brown giving an air of warmth and comfort. The chairs, of wing type with loose cushions, are upholstered in brown-patterned moquette, and the floor is covered with heavy brown pile carpets. The beauty and careful combination of the wood panelling is a fine tribute to British craftsmanship.

The saloon is panelled in highly polished natural light walnut veneer, with dark burr walnut pilasters on panels between the deep windows. The ceilings are panelled in flat stippled vellum and the saloon is lit with concealed electric lights covered by satin-faced gloss panels in bronze frames fitted flush with the ceiling and end panels. A first class saloon, corridor coach and two brakes completed the formation. The approach road and No. 1 platform at Paddington and the arrival platform at Birmingham were decorated for the occasion.

Each of the other three groups was concerned in the conveyance of the royalties arriving for the ceremony. When Princess Marina came to London from Paris on November 21, the Southern Railway ran a special train of two Pullman cars, a first brake and a van from Dover to Victoria. The train staff were Inspector Shaw and Guard Moorcroft, and Locomotive Inspector E. Turner, Driver P. Tucker and Fireman H. Jenkins were on the footplate of L1 class 4-4-0 No. 1386. The train arrived at Victoria one minute before time, notwithstanding the fog.

On November 23, King Haakon of Norway travelled from Newcastle to King's Cross in a special composed of West Riding Pullman stock. Atlantic No. 3295, driven by Driver W. Hammond and Fireman A. Bell, of King's Cross, hauled the train on the latter part of its journey.

The King and Queen of Denmark arrived in this country at Tilbury on November 26, whence they travelled to St. Pancras in an L.M.S. special composed of one corridor brake, one brake first, the Midland Railway royal saloon, and a brake lounge. The engine was 2-6-4T No. 2105, in charge of Driver J. Wood and Fireman J. Willoughby, both of Plaistow.

Improving the Ventilation of Railway Carriages

In order to ensure that passengers are supplied with clean filtered air, the L.N.E.R. has for some considerable time been experimenting with air-conditioning plants on various vehicles running on the East Coast route. The first experiments were made by two of the constituent companies as far back as 1906, and a number of vehicles were fitted with improved ventilating apparatus. This apparatus did not, however, prove entirely satisfactory, and it was not until 1929 that the question was again taken actively in hand.

During this year a sleeping car was provided with the Thermotank system of pressure ventilation and heating, the air being taken from the corridor of the vehicle and, after being filtered, passed through a heater into a duct above the corridor roof. Air at atmospheric temperature was also delivered by the same fan into a further duct over the corridor. From these ducts, connections were made to each berth and, by means of a Punkah louvre fitting, the temperature of the air supplied to the berth could be regulated by the passenger. This system of ventilation and heating has also been fitted in the first class corridor coaches working in the Flying Scotsman.

Since the experimental sleeping car was fitted, further experiments have been made, and all the sleeping cars built by the L.N.E.R. since 1930 have been provided with apparatus on the Thermotank system. An improvement has been made in that the supply of cold air is now drawn direct from the atmosphere instead of from the corridor as in the earlier cars.

Further developments have followed, and the East Coast expresses leaving King's Cross at 5.30 p.m. and Newcastle at 8.15 a.m., together with certain of the new tourist trains, are now provided with an apparatus of a different type supplied by J. Stone & Co. Ltd. The apparatus is accommodated in a box on the underframe, and air is drawn into the vehicle through oil filters by means of an electrically driven fan. After leaving the fan, the air is heated by steam, to give a comfortable temperature inside the vehicle, passed through ducts under the floor, and finally discharged into the compartments through nozzles under the seats.

The operation of the equipment is entirely automatic, as the fan motor is switched on by a thermostat as soon as steam is applied to the train. The power supply is derived from the lighting batteries, and the equipment continues to function until the steam supply is cut off. During the winter period the air supply is maintained at a constant temperature by means of an ingenious arrangement of thermostatically-operated shutters, and during the summer months when steam is not normally supplied for the heating of trains, the equipment provides filtered air at atmospheric temperature.

The new system as applied to these trains not only provides a supply of clean fresh air to passengers, but as the air is introduced under a very slight pressure it also ensures an absence of objectionable draughts. We refer to this subject in an editorial note on page 878.

Entre Rios and Diesel Traction

Speaking at the ordinary general meeting of the Entre Rios Railways Company on November 23, Sir Follett Holt said that no Transport Bill would protect a railway unless it could give as good or better service than could be given by the road. As far as cargo work was concerned, the company could provide all required facilities, but for passengers this could not be said at present. During a recent visit to Entre Rios, Sir Brodie Henderson and himself were able to examine with Major Loewenthal a proposal put forward by Mr. Etheridge, the Traffic Manager, to revolutionise the local passenger service by adopting diesel-driven units to provide a faster and more frequent service at much less operating cost than was possible by the present cumbersome steam trains. Sir Brodie, having specialised in the development of the diesel engine, had devised a suitable type of car, which the manufacturers, The Birmingham Railway Carriage & Wagon Company, were now building—11 cars in all. They expected to have these self-propelled units in service within the next 12 months. These new cars would also have the effect of reducing the cost of maintenance of a certain number of steam locomotives and passenger coaches which they would replace.

QUESTIONS IN PARLIAMENT

Transport of Mails on Trains

In the House of Commons on November 26, Captain Erskine-Bolst asked the Postmaster-General whether his attention had been called to the recent case at the Tower Bridge police court of an individual charged with stealing 17 mail bags and other postal packets on different dates on the Southern Railway since the month of August; and whether he proposed to make better arrangements to ensure that adequate protection was given to mails in transit.

Sir Kingsley Wood replied: Yes. My hon. and gallant friend may rest assured that all practicable steps are taken in consultation with the railway companies to safeguard the mails. The total losses on railways amount to less than one bag in a million.

Rail Freight Rates for Grain

Mr. Lambert asked the Minister of Agriculture, on November 26, if he was aware that the railway companies charged a higher rate for the conveyance of grain than for the transport of meal; and whether, as this gave a preference to the port as compared with the country miller, he would take steps, by legislation or otherwise, to abolish such preference, and thus secure equality as between port and country millers.

Mr. Elliot: The railway companies are required by the Local Government Act, 1929, to give rebates on the carriage charged for certain classes of agricultural commodities. These traffics are embodied in the eleventh schedule to the Act, and were specially selected after consultation with the agricultural industry. They include fertilisers and feeding stuffs in common use (other than whole grain), potatoes, milk and livestock, and an extension of the list of commodities would involve a reduction in the amount of the rebate for those already included. In the circumstances, I cannot see my way to propose any alteration in the list such as my right hon. friend suggests.

Overcrowding on the Metropolitan Railway

Mr. Goldie asked the Minister of Transport on November 27 whether he was aware of the excessive overcrowding now prevalent during rush hours on the suburban trains of the Metropolitan Railway; whether, as in the case of omnibuses, any regulations existed as to the numbers of seated and standing passengers permitted to travel in the carriages of such trains; if so, whether any and how frequent inspections were made by officials of his department to ensure compliance therewith; and whether, in the interests of public safety and convenience, he would make representations to the London Passenger Transport Board with a view to the provision of more adequate accommodation.

Mr. Hore-Belisha:—As regards the first part of my hon. and learned friend's question, my attention has not recently been specifically called to any cases of excessive overcrowding during rush hours on the suburban trains of the Metropolitan Railway. As regards the second part, I have no power to control by regulation or otherwise the numbers of seated or standing passengers permitted to travel in these trains. The answer to the third part of the question, therefore, does not arise. If, however, my hon. and learned friend has any specific suggestions to make, I would bring them to the notice of the L.P.T.B.

Flint Station Platform

Mr. Llewellyn-Jones asked the Minister of Transport on November 27 whether he was aware of the unsafe condition of the platform at the Flint railway station and that repeated appeals had been made to the L.M.S.R. to execute the necessary works to render the platform safe; and whether, having regard to the failure of the company to carry out those works, he could see his way to intervene so that the necessary alterations could be undertaken without delay.

Mr. Hore-Belisha:—I was not aware that any representations with regard to the condition of the platform at Flint railway station had recently been made to the company, and I have no power to require the company to carry out the proposed works.

Higher Speed of Trains

Mr. Robinson asked the Minister of Transport on November 27 whether he was satisfied that the railways of Great Britain were giving adequate attention to research and experiment in the development of high-speed railway transport; and to what extent the average speed of express railway trains in Great Britain at the present time exceeded the speeds of similar trains 25 years ago.

Mr. Hore-Belisha:—The railway companies have assured me that they are keeping in close touch with all the developments which are taking place in connection with high speed transport. There has been a marked increase during recent years in the number of express trains run at speeds of 50 to 60 m.p.h. or over, but I am not in a position to give comparative figures of average speeds.

British Investment in Argentine Railways

Sir Cyril Cobb asked the Secretary of State for Foreign Affairs on November 28 whether, in view of the hardships imposed upon British savings in various Argentine railways, he would bring to the notice of the Argentine Government the statement made by the Chairman of the Central Argentine Railway on November 15 that the Argentine public did not appreciate the fact that the Argentine railways were constructed with British capital which had caused the development and prosperity of Argentina and was entitled to reasonable remuneration.

Mr. Anthony Eden, Lord Privy Seal, who replied:—The statement to which my hon. friend refers was made in the course of the Chairman's speech to the shareholders in the Central Argentine Railway. This was fully reported in the press, and will doubtless reach the proper quarter in Argentina. The Argentine Government are fully aware of the interest taken by His Majesty's Government in the position of British railways and other British interests in Argentina, and I do not think that any useful purpose would be served by acting as my hon. friend suggests.

Parliamentary Notes

Tyne-Solway Canal Advocated

Dr. Leech, one of the Tyneside M.P.'s, made a strong plea in the House of Commons on November 22 in favour of a canal from the Tyne to the Solway. The Tyne-Solway Canal, he said, was talked about 100 years ago, and it was being talked about to-day. He believed it was worthy of the attention of the Commissioner for Depressed Areas—Mr. Percy Malcolm Stewart. He (Dr. Leech) regarded the Tyne-Solway Canal as being one means of alleviating distress, first, because he considered it a great project, and second, because he believed the canal was capable of great commercial possibilities and would possess great strategic value.

North London Electrification

Speaking in Parliament on November 23 on an amendment to the Royal Address, Mr. Summersby, the member for Shoreditch, expressed regret that no reference had been made to improving the transport facilities in North London by railway electrification, and disappointment that nothing had been done since the formation of the London Passenger Transport Board. He instanced Muswell Hill as a district to which there was neither tube nor other electric train, and said that action was expected from the National Government in pushing forward the electrification of the suburban main lines and the construction of tubes.

Electricity (Supply) Bill

Mr. Emmott, in the House of Commons on November 27, presented a petition, on behalf of authorised electricity undertakers, some owning and others not owning selected stations, praying that the Electricity (Supply) Bill may be sent to a Select Committee of the House. Notice of a resolution to the same effect, after the second reading of the Bill, has been given by forty Unionist members. The purpose of the Bill is to authorise the Central Electricity Board to supply electricity directly to railway companies.

NOTES AND NEWS

Sussex Station Renamed.—We are informed by the Southern Railway that the renaming of Waldron and Horeham Road as Waldron and Horam, announced on p. 872 last week, is to be effective as from January 1 next.

Stained Glass Windows for German Station.—Two stained glass windows 50 ft. wide and over 19 ft. high, executed by local artists, will be a feature of the new entrance hall of the Düsseldorf Central station of the German State Railway, which is nearing completion.

Vacuum Brakes for South African 4-8-2 Locomotives.—The fifty 19C class 4-8-2 locomotives, described in our issue of November 16, which are being supplied to the South African Railways by the North British Locomotive Co. Ltd., are all fitted with vacuum brake equipment on the engine and tender wheels supplied by the Consolidated Brake & Engineering Co. Ltd., an associated company of G. D. Peters & Co. Ltd.

Success of L.M.S.R. Caravan Coaches.—So successful have been the caravan coaches introduced by the L.M.S.R. this year that over 40 tenancies have already been booked for the 1935 holiday season, while the provision of additional vehicles and the extension of the scheme to Scotland are under consideration. The 42 L.M.S.R. caravan coaches were all in occupation practically continuously during the recent summer season.

The Week's Road Accidents.—The Ministry of Transport return for the week ended November 24 of persons killed or injured in road accidents is as follows:—

	Killed	Deaths resulting from previous accidents	Injured
England	100 (83)	21 (36)	3,367 (3,400)
Wales ...	3 (5)	1 (—)	149 (143)
Scotland	20 (12)	1 (4)	364 (352)
	123 (100)	23 (40)	3,880 (3,895)

The total fatalities of the week, as the result of road accidents, were therefore 146, as compared with 140 for the previous week.

Railway Freight Rebates.—The Railway Rates Tribunal has decided that certain alterations, to take effect on December 1, shall be made in the railway freight rebates scheme. The existing rates of the rebates are to be altered to the following:—Part Two. Agricultural selected traffics; 15 per cent. of the carriage charges or tolls; Part Three. Coal, &c., selected traffics—1½d. a ton and 27½ per cent. of the remainder of the carriage charges. Toll traffic—32½ per cent. of the tolls; Part Four. Other selected traffics—12½ per cent. of the carriage charges or tolls. The present rates of the rebates, in force up to November 30 are:—Part Two: Agricultural selected traffics: 16⅔ per cent. of the carriage charges or tolls; Part Three: Coal, &c., selected traffics, 1½d. a ton and 38½ per cent. of the remainder of the carriage charges. Toll traffic, 42½ per cent. of the tolls; Part Four: Other selected traffics—22½ per cent. of the carriage charges or tolls.

Armstrong-Saurer Sales Headquarters.—The sales departments of Armstrong-Saurer Commercial Vehicles Limited will be at the company's Great West Road building, "We Serve," Brentford, as from December 1. The telephone number is Ealing 1404, and the telegraphic address Saurer, Brentford.

London Transport Acquisitions.—One of the few outstanding independent bus operators in the outer London area passed to the London Passenger Transport Board on Wednesday, November 28. The business taken over was the Imperial Bus Service of A. E. Blane Limited, Romford, with 11 single-deck vehicles working services between Romford and Rainham, and between Collier Row and Upminster.

L.P.T.B. and the Tilling Claim.—The award of the London Passenger Transport Arbitration Tribunal in regard to the main claim of Thomas Tilling Limited for the compulsory transfer of its London omnibus business to the London Passenger Transport Board was issued on Wednesday. The Tilling claim was for £3,162,912, and the L.P.T.B. offer £1,032,221, in each case in stock. The award is £1,750,000, payable as to £1,462,259 in C stock; £143,871 in A (4½ per cent.) stock; and £143,870 in B (5 per cent.) stock.

London Transport Railways and Explosives.—The London Passenger Transport Board gives notice of its intention to apply to the Minister of Transport for his sanction to byelaws relating to explosives similar to those in force upon the systems of the railway companies operating in England, with the following additions: (1) "No explosive shall be brought, sent or forwarded to or conveyed upon any railway of the Board: provided that this byelaw shall not apply to the section of the railways of the Board north of and including Finchley Road station which formerly formed part of the Metropolitan Railway." (2) The extension of the byelaw relating to the conveyance of safety cartridges and percussion caps and safety fuse (for blasting) by passenger train to permit of the conveyance of tracers for line-throwing guns.

New Polish Railways.—Two new lines between Cracow and Miechow (32 miles) and between Warsaw and Radom (64 miles) were officially opened by President Moscicki on Saturday and Sunday. The distance by rail from Warsaw to Cracow is thus reduced by 27 miles and that between the capital and the important industrial centre, Radom, by no fewer than 36 miles—64 as opposed to 100 miles formerly.

Institute of Patentees.—This institute has changed its address to 10, Victoria Street, Westminster, S.W.1. The telephone number is Victoria 4222.

Transport in Northern Ireland.—The King's speech read by the Governor of Northern Ireland at the opening of the second session of the fourth Parliament of Northern Ireland, on November 20, contains the following:—"For a considerable time past the serious situation in regard to transport in Northern Ireland has been the subject of grave concern to my Ministers, and proposals will be laid before you designed with the object of securing the most efficient and economic use of every form of transport." A Bill to establish a Road Transport Board is likely to be introduced early next year.

Canadian Wood for British Sleepers.—Two representatives of the L.M.S.R., Mr. W. J. Manclark, Assistant (Purchasing), Stores Department, and Mr. J. W. Melville, Permanent Way Assistant, are investigating the possibilities of Canadian timber for railway sleepers. Quebec, the Maritimes, Newfoundland, Ontario and British Columbia are being visited to determine the suitability of the timber for this purpose. Before the war, the bulk of the supplies for British railways were drawn from Russia, Poland and other Scandinavian countries. British Columbia timber has already been found satisfactory and large orders have been placed for it.

Humber Coal Exports.—The Secretary for Mines, answering a question in the House of Commons on November 15 as to the quantity of coal exported from the four Humber ports during the nine months ended September 30, said that the total was 2,425,073 tons, compared with 2,377,623 tons, 2,439,679 tons, and 3,072,730 tons, respectively, for the corresponding nine months in 1933, 1932, and 1931. In the 1934 period Goole exported 544,227 tons, Grimsby 56,332 tons, Immingham 1,167,638 tons, and Hull 656,876 tons. The Immingham 1934 figure is below that for 1931, which was 1,202,365 tons, but is an improvement on 1932 and 1933.

Buenos Ayres Western Notes.—The directors of the Buenos Ayres Western Railway are offering to holders of the £1,000,000 5 per cent. 10-year bearer notes (1924), which mature on January 1 next, the right to apply for an extension for three years of 60 per cent. of the nominal value. The converted notes will bear interest at 4 per cent. per annum. Noteholders accepting the offer will receive a cash payment of 6s. for each £100 deposited. The directors reserve the right to issue at 99½ per cent. new 4 per cent. three-year notes maturing on January 1, 1938, but so that the total of the new notes which will remain as the result of the offer does not exceed £600,000.

Railway Companies and Electricity

The following letter to the Editor of *The Times* from Sir Herbert Walker appeared yesterday:—

SIR,—The Electricity (Supply) Bill, which is warmly welcomed by the railway companies, proposes to permit the Central Electricity Board to supply the railways direct from the grid with current for haulage or traction purposes. The measure, however, appears to have evoked criticism upon the ground that it will enable the board to compete unfairly with "authorised undertakers" in supplying electricity to railways at less than cost price.

Surely there must be some misconception here, as, apart from other safeguards, the Bill specifically prohibits the board from entering into an agreement with a railway company for a supply of electricity until the board has satisfied the Electricity Commissioners that the terms and prices upon which the supply would be given will not result in a financial loss to the board. The experience of the Southern Railway Company in the carrying out of its recent electrification schemes has demonstrated the importance of negotiating with a single authority for the supply of electric power and the difficulties and disadvantages which arise when a railway company is under obligation to make individual agreements with "authorised undertakers" within the territory to be served by the proposed scheme of electrification.

If any further schemes for railway electrification are to be entertained, the railway companies consider it essential that they should be permitted to negotiate with and obtain their current direct from the Central Board, and this right the Bill now before Parliament proposes to afford

Yours faithfully,
H. A. WALKER, General Manager,
Southern Railway Company,
Waterloo Station, S.E.1.
November 28.

We comment editorially on this subject on page 881 herein.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 47th Week			Totals to Date.		
	1934	1933	Inc. or Dec.	1934	1933	Inc. or Dec.
	£	£	£	£	£	£
L.M.S.R. (6,941¼ mls.)						
Passenger-train traffic...	383,000	370,000	+ 13,000	22,422,000	22,058,000	+ 364,000
Merchandise, &c. ...	475,000	463,000	+ 12,000	20,985,000	19,655,000	+1,330,000
Coal and coke ...	266,000	254,000	+ 12,000	10,606,000	10,159,000	+ 447,000
Goods-train traffic ...	741,000	717,000	+ 24,000	31,591,000	29,814,000	+1,777,000
Total receipts	1,124,000	1,087,000	+ 37,000	54,013,000	51,872,000	+2,141,000
L.N.E.R. (6,339 mls.)						
Passenger-train traffic...	253,000	251,000	+ 2,000	14,522,000	14,284,000	+ 238,000
Merchandise, &c. ...	361,000	360,000	+ 1,000	14,814,000	13,839,000	+ 975,000
Coal and coke ...	253,000	244,000	+ 9,000	10,648,000	9,839,000	+ 809,000
Goods-train traffic ...	614,000	604,000	+ 10,000	25,462,000	23,678,000	+1,784,000
Total receipts	867,000	855,000	+ 12,000	39,984,000	37,962,000	+2,022,000
G.W.R. (3,750¾ mls.)						
Passenger-train traffic...	161,000	157,000	+ 4,000	9,517,000	9,499,000	+ 18,000
Merchandise, &c. ...	186,000	185,000	+ 1,000	8,452,000	7,957,000	+ 495,000
Coal and coke ...	105,000	107,000	− 2,000	4,637,000	4,562,000	+ 75,000
Goods-train traffic ...	291,000	292,000	− 1,000	13,089,000	12,519,000	+ 570,000
Total receipts	452,000	449,000	+ 3,000	22,606,000	22,018,000	+ 588,000
S.R. (2,176 mls.)						
Passenger-train traffic...	231,000	229,000	+ 2,000	13,741,000	13,528,000	+ 213,000
Merchandise, &c. ...	65,500	65,000	+ 500	2,996,000	2,882,500	+ 113,500
Coal and coke ...	33,500	36,000	− 2,500	1,442,000	1,369,500	+ 72,500
Goods-train traffic ...	99,000	101,000	− 2,000	4,438,000	4,252,000	+ 186,000
Total receipts	330,000	330,000	—	18,179,000	17,780,000	+ 399,000
Liverpool Overhead ... (6½ mls.)	1,117	1,058	+ 59	53,528	53,270	+ 258
Mersey (4½ mls.) ...	4,060	4,040	+ 20	190,545	186,906	+ 3,639
*London Passenger Transport Board ...	509,300	514,900	− 5,600	11,121,600	10,983,600	+ 138,000
IRELAND.						
Belfast & C.D. pass. (80 mls.)	1,807	1,713	+ 94	118,186	119,627	− 1,441
" " goods	504	583	− 79	24,364	24,522	− 158
" " total	2,311	2,296	+ 15	142,550	144,149	− 1,599
Great Northern pass (562 mls.)	7,600	6,550	+ 1,050	467,200	365,250	+ 101,950
" " goods	9,750	9,800	− 50	403,050	330,050	+ 73,000
" " total	17,350	16,350	+ 1,000	870,250	695,300	+ 174,950
Great Southern pass. (2,158 mls.)	18,554	18,171	+ 383	1,125,162	1,109,165	+ 15,997
" " goods	43,078	35,584	+ 7,494	1,555,034	1,468,059	+ 86,975
" " total	61,632	53,755	+ 7,877	2,680,196	2,577,224	+ 102,972

* 21st week, the receipts for which include those undertakings not absorbed by the L.P.T.B. in the corresponding period last year; last year's figures are, however, adjusted for comparative purposes.

British and Irish Railways Stocks and Shares

Stocks	Highest 1933	Lowest 1933	Prices Nov. 28, 1934	Prices Rise/Fall
G.W.R.				
Cons. Ord. ...	55½	31	51	−½
5% Con. Prefce. ...	109¾	69½	115	−2
5%Red.Pref.(1950)	109¼	87½	110½	—
4% Deb.	108 15/16	99¼	115½	−1
4½% Deb.... ...	108	100¾	117½	—
4½% Deb.... ...	116	106	126½	—
5% Deb.	128	117¼	133½	—
2½% Deb.... ...	65	60	72½	—
5% Rt. Charge ...	124	111½	132½	—
5% Cons. Guar. ...	122	103	130½	−1
L.M.S.R.				
Ord.	29⅞	12⅛	21½	−½
4% Prefce. (1923)	51	17	49	−1½
4% Prefce. ...	72	33¼	84½	−1
5%Red. Prf. (1955)	93	47¼	103½	—
4% Deb.	103¼	84½	110	−3
5%Red.Deb.(1952)	114	105	116½	—
4% Guar.	97¼	68⅜	105	−1
L.N.E.R.				
5% Pref. Ord. ...	22½	7¾	15¾	—
Def. Ord.	10¾	4⅛	7⅝	−⅛
4% First Prefce. ...	65½	19⅜	69	−1
4% Second Prefce.	40½	12¼	31	−1
5%Red.Pref.(1955)	83¾	27	89½	−1
4% First Guar. ...	94¾	58¼	101½	−2
4% Second Guar.	89¼	48	95½	−1½
3% Deb.	77	60¼	86	−2½
4% Deb.	102¾	80	109½	−3½
5%Red.Deb.(1947)	112	102½	116	—
4½% Sinking Fund Red. Deb.	107½	98¾	108½	—
SOUTHERN				
Pref. Ord.... ...	71	27¾	79	—
Def. Ord.	24⅜	9⅜	23½	—
5% Prefce. ...	107 11/16	74	116	−1½
5%Red.Pref.(1964)	107¾	78⅞	114½	+1
5% Guar. Prefce.	124¼	102¾	131½	—
5%Red.Guar.Pref. (1957)	115⅝	103½	118	—
4% Deb.	107½	96¾	115	−1
5% Deb.	126½	114¼	132½	—
4% Red. Deb. 1962–67	107¼	100	112½	—
BELFAST & C.D.				
Ord.	6		5	—
FORTH BRIDGE				
4% Deb.	99½	95½	111½	—
4% Guar. ...	98½	94	110½	—
G. NORTHERN (IRELAND)				
Ord.	7½	3½	7	—
G. SOUTHERN (IRELAND)				
Ord.	28	16	16½	—
Prefce.	24	12⅛	16½	—
Guar.	42	16¾	41¾	−¼
Deb.	60	30⅞	64½	+3½
L.P.T.B.				
4½% "A" ...	117⅞	112	124½	−1
5% "A"	127¼	119¼	133½	−1
4½% "T.F.A." ...	111¼	106	113	+½
5% "B"	122½	114	129	−1
"C"	86¾	74½	91	−2
MERSEY				
Ord.	16¼	5	9	—
4% Perp. Deb. ...	83	63⅞	92½	+5
3% Perp. Deb. ...	62	51	67¼	+1
3% Perp. Prefce....	50⅝	27	47½	+1

CONTRACTS AND TENDERS

The Pullman Car & Manufacturing Corporation of Chicago announces the receipt of an order from the National Railways of Mexico for 1,000 box cars and 200 steel gondola cars.

Road Vehicle Orders

The L.N.E.R. has placed orders for road transport vehicles as follow :—

Metropolitan-Cammell Carriage & Wagon Co. Ltd.: 20 3-ton mechanical horse platform trailers and 19 3-ton mechanical horse hinged-sided trailers.

Scammell Lorries Limited: 30 3-ton mechanical horses, 35 3-ton mechanical horse platform trailers, 52 sets of coupling gear for 3-ton trailers, 30 sets of coupling gear for 6-ton trailers, 35 sets of coupling gear for 3-ton tractors, and 22 6-ton mechanical horses.

Cranes (Dereham) Limited: One horse ambulance, one 18-ft. and six 15-ft. platform trailers for 6-ton mechanical horses and 23 15-ft. hinged-sided trailers for 6-ton mechanical horses.

Rootes Limited: 35 3-ton Karrier mechanical horses.

Car Mart Limited: Two Ford 30-cwt. light vans with hinged sides.

Stewart & Ardern Limited: One 1-ton Morris-Commercial parcels van.

Leyland Motors Limited has received a further order for 37 Cub passenger vehicles, of which six will be oil-engined, from Crosville Motor Services Limited. This order is additional to that for a total of 52 Leyland passenger vehicles placed last week by the same operators and recorded in this column in last week's issue.

Leyland Motors Limited also announces that the Scottish Motor Traction Co. Ltd. and its associated companies have, during the period of the Scottish Show, placed further extensive contracts with that firm in addition to those previously announced.

The Tees Side Bridge & Engineering Co. Ltd. has secured an order for three plate girder deck spans for the extension of Zifta Barrage swing bridge, Egyptian Delta Light Railways.

The Evans & Reid Coal Co. Ltd. has been awarded a contract for the supply of 44,000 metric tons of coal by the Egyptian State Railways. It is considered very probable, states Reuters, that another British firm will secure the rest of the award, the total of which is to be 150,000 tons. Evans & Reid submitted a tender of 23s. 2½d. per ton, c.i.f. and 18s. 1½d. f.o.b.

Vickers (India) Limited has received orders from the East Indian Railway for copper and brass round and sheets and tubes.

Imperial Chemical Industries (India) Limited has received orders from the East Indian Railway for hexagon brass, manganese bronze round, and brass tubes.

J. Booth & Bros. Ltd., through Bell's Asbestos & Engineering (India) Limited, has secured orders from the Indian Stores Department for two broad-gauge steam locomotive grab cranes of 3-tons capacity and 22-ft. radius (total price, Rs. 30,800 f.o.r. Calcutta), and two similar cranes but of 2-tons capacity and 20-ft. radius for metre-gauge service (total price Rs. 27,400 f.o.r. Calcutta) together with spares in each case to a combined value of Rs. 4,104.

The Indian Stores Department has placed rate contracts for steel files, to meet the requirements of the East Indian, North Western, and Great Indian Peninsula Railways, with Jessop & Co. Ltd., Richardson & Cruddas Limited, and Plummer Bros. & Company.

Jessop & Co. Ltd. has secured an order from the Stores Purchase Committee, Government of Mysore, for six four-wheeled covered goods wagons comprising underframes and bodies and all necessary fittings, at a total price of Rs. 21,300 f.o.r. Dum Dum.

The South Indian Railway has placed orders for materials to be supplied to the inspection of the consulting engineers, Messrs. Robt. White & Partners, as follow :—Imperial Chemical Industries Limited: 16½ tons of copper rods and tubes; and The British Mannesmann Tube Co. Ltd.: 18 tons of tubular steel poles.

Sir Wm. Arrol & Co. Ltd., through Braithwaite & Co. (India) Ltd., has received an order from the Indian Stores Department for one engine hoist for lifting metre-gauge locomotives and tenders on to broad-gauge well trucks and capable of dealing with a maximum working load of 60 tons at 4 ft. per min., with a 12 b.h.p. at 600 r.p.m. motor (total cost, Rs. 14,786 f.o.r. Calcutta).

The Weldless Steel Tube Co. Ltd. has received an order from the Peruvian Corporation for 500 Corrostite brand rust-resisting black steel boiler tubes.

The New Zealand Government Railways Administration is investigating the possibilities of obtaining a railcar unit of suitable design for branch line working.

Stewarts and Lloyds Limited has received an order from the Trans-Zambesia Railway for 5,200 ft. of 3-in. galvanised wrought-iron water piping, together with a quantity of valves and fittings.

New South African Railway Coaches

In our issue of August 17 we announced that a contract had been placed by the South African Railways and Harbours Administration with the Birmingham Railway Carriage & Wagon Co. Ltd. for the supply of 20 first class day and sleeping coaches. It was not until August 23 that the Birmingham Company received all the necessary information to put the work in hand. The contract date for final shipment was December 13, but the first five of the vehicles were completed on November 5 and the final batch was passed for shipment on November 27, so that the whole of the coaches will be in traffic in South Africa by Christmas. The contract was obtained in the face of severe competition both at home and abroad.

The Agent, Eastern Bengal Railway, invites tenders, receivable by December 21, for equipment for the heat treatment shop at Kanchrapara, including oil-fired car bottom furnace, oil-fired twin chamber solid hearth furnace, oil-fired tool-hardening furnace, oil-fired lead pot, electric hardening furnace, electric tempering furnace, recording potentiometers, hardness testing machines and pyrometers, to the Eastern Bengal Railway's specifications.

Tenders, receivable by December 11, at 132, Gresham House, Old Broad Street, London, E.C.2, are invited by the Bengal-Nagpur Railway for 582 steel carriage and wagon axles.

Forthcoming Events

Nov. 30 (*Fri.*).—L.N.E.R. Musical Society, at Hamilton Hall, London, E.C.2, 8 p.m. Bohemian Concert.

Dec. 4 (*Tues.*).—Industrial Transport Association, at British Iron and Steel Federation, Caxton House (East), Tothill Street, London, S.W.1, 6.30 p.m. "Deferred Rebates," by Mr. C. E. Jordan.

Institute of Transport (Metropolitan Graduate), at Inst. of Electrical Engineers, Savoy Place, W.C.2, 6 p.m. "Rationalisation in the Goods Department," by Mr. L. S. Sherwood.

L.N.E.R. (Middlesbrough) Lecture and Debating Society, at Cleveland Scientific and Technical Inst., Corporation Road, 7.15 p.m. "Chemistry as Allied to a Railway Company," by Mr. H. A. Houston.

Retired Railway Officers' Society, in Room 300, Great Eastern Hotel, Liverpool Street, London, E.C.2, 2.30 p.m. Ordinary Meeting.

Dec. 5 (*Wed.*).—Institute of Metals (London), at Society of Motor Manufacturers, 83, Pall Mall, S.W.1, 7.30 p.m. "Manganese Bronze," by Mr. W. Lambert.

Dec. 5-6.—National Road Transport Conference, at Harrogate.

Dec. 6 (*Thurs.*).—L.N.E.R. (York) Lecture and Debating Society, at Railway Inst., Queen Street, 7 p.m. "The Development of Road Motor Services in the North-Eastern Area," by Mr. A. A. Harrison.

Railway Students' Association, at London School of Economics, Houghton Street, W.C.2. "The Future of Railways," by Mr. E. J. H. Lemon, O.B.E.

Dec. 7 (*Fri.*).—Institute of Transport (Nottingham Graduate), at Guildhall, 7 p.m. "Railway Cartage Services," by Mr. G. G. Goodings.

Railway Students' Association (Edinburgh) at Goold Hall, St. Andrew Square, 7.30 p.m. "L.N.E.R. Continental Services," by Mr. A. L. Gibson.

Dec. 8 (*Sat.*).—Stephenson Locomotive Society, at King's Cross Station, London, 3 p.m. Annual General Meeting. 6.30 p.m., at Midland Grand Hotel, St. Pancras, Annual Dinner.

Dec. 10 (*Mon.*).—G.W.R. (Birmingham) Lecture and Debating Society, at Great Western Hotel, Snow Hill Station, 6.30 p.m. "The Southern Railway," by Mr. J. B. Elliot.

Forthcoming Meetings

Dec. 5 (*Wed.*).—**Madras & Southern Mahratta Railway Co. Ltd.** (Ordinary General), 25, Buckingham Palace Road, S.W.1, at 12 noon.

Dec. 12 (*Wed.*).—**Mexican Railway Co. Ltd.** (General), Winchester House, Old Broad Street, E.C.2, at 2.30 p.m.

OFFICIAL NOTICES

London & North Eastern Railway

NOTICE is hereby given that, for the purpose of preparing the Warrants for Interest on the Company's 3 per cent. and 4 per cent. Debenture Stocks and 4½ per cent. Sinking Fund Debenture stock for the half-year ending 31st December, 1934, the balances will be struck as at the close of business on 11th December, and Interest will be payable only to those Stockholders whose names are registered on that date.

Transfers of the above-mentioned Stocks should, therefore, be lodged with the Registrar of the Company at Hamilton Buildings, Liverpool Street Station, London, E.C.2, before 5 p.m. on 11th December.

By Order,
JAMES McLAREN,
Secretary.

Marylebone Station,
London, N.W.1.
30th November, 1934.

PATENTS for Inventions, Trade Marks, Advice, Handbook, and consultations free. King's Patent Agency, Ltd. (B. T. King, C.I.M.E., Registered Patent Agent, G.B., U.S., and Canada), 146a, Queen Victoria Street, London, E.C.4. 49 years' references. 'Phone City 6161.

Bengal-Nagpur Railway Company Limited

THE Directors are prepared to receive Tenders for:—

582 STEEL CARRIAGE and WAGON AXLES.

Specification and Form of Tender can be obtained at the Company's Offices, 132, Gresham House, Old Broad Street, London, E.C.2, on or after Wednesday, 28th November, 1934.

A fee of 10s. will be charged for each copy of the Specification, which is not returnable.

Tenders must be submitted not later than noon on Tuesday, 11th December, 1934.

The Directors do not bind themselves to accept the lowest or any Tender, and reserve to themselves the right of reducing or dividing the order.

By Order of the Board,
R. GRANT,
Secretary.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Thursday. All advertisements should be addressed to:—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

The Buenos Ayres Great Southern Railway Company Limited.

NOTICE.

THE Directors of the Buenos Ayres Great Southern Railway Co. Ltd. hereby give notice that the Register of Debenture Stockholders will be closed from Thursday, the 29th November, to Wednesday, the 12th December, 1934, both days inclusive.

By Order of the Board,
R. TRISTRAM HARPER,
Secretary.

River Plate House,
Finsbury Circus,
London, E.C.2.
22nd November, 1934.

Universal Directory of Railway Officials and Railway Year Book

40th Annual Edition, 1934-35

Price 20/- net.

THE DIRECTORY PUBLISHING CO. LTD.
33, Tothill Street, London, S.W.1.

RAILWAY AND OTHER REPORTS

Midland Railway Company of Western Australia.—The directors have authorised a final payment of interest on the second mortgage cumulative income debenture stock, on account of the year ending June 30, 1934, at the rate of 3 per cent., less income tax at 4s. 6d. in the £1, payable January 1, 1935, making, with the interim payment of 2 per cent. on July 1, 1934, 5 per cent. for the year.

Samana & Santiago Railway.—Gross receipts for the year ended December 31, 1933, amounted to £26,248, against £25,083 in 1932, and the total expenditure was £24,711, compared with £29,274, showing a still further reduction of 15·59 per cent., giving an operating ratio of 94·14 per cent. compared with 116·71 per cent. in 1932. A credit balance of £1,537 (compared with a debit balance of £4,191 in the previous year) is carried from revenue to net revenue account, and the deficiency on the year is £732 compared with £6,442 in 1932. The debit balance to be carried forward is £24,101.

North Western of Uruguay Railway.—Gross receipts for the year ended June 30, 1934, amounted to £36,644, a decrease of £7,732, or 17·42 per cent., as compared with the previous year. There was a small increase in the carriage of live stock. Goods traffic tonnage showed a decrease of 30·54 per cent., due to the general depression and the fall in transit and saladero traffic. Expenses in currency were 4·80 per cent. lower, but on a sterling basis, owing to the improvement in the value of the dollar, they were £805, or 2·35 per cent., higher at £35,018. The profit on working was £1,626, against £10,163. The final result for the year, after allowing for debenture interest and other prior charges, is a net loss of £12,819, which, added to the debit balance of £19,427 brought forward, makes a total debit balance of £32,246.

The Underground Liquidation.—The liquidator of the Underground Electric Railways Company of London Limited (in voluntary liquidation) states that there are certain outstanding questions with the Inland Revenue authorities which cannot be disposed of before judgment is given by the House of Lords in a pending case between the Inland Revenue and another company in which similar issues are involved. Some months must elapse before these matters can be determined, and it is therefore proposed to make a further cash distribution to the shareholders of 2d. a share, leaving a balance of approximately 1d. a share to be distributed when the exact amount can be ascertained. The necessary warrants, together with the payments to those shareholders who are entitled thereto of their proportions of the net proceeds of sale of fractions of shares in the Associated Equipment Co. Ltd., will be sent out on December 27 next.

Remodelling of Fenchurch Street Station, L.N.E.R.

The final stage of the improvement works, which have been in hand for some time at Fenchurch Street, has now begun. The bulk of the permanent way alterations has been carried out, and the new fast lines have just been brought into use. The circulating area has been cleared and a barrier with gates and indicators is being erected. The principal feature of the undertaking generally has been the necessity for intricate piecemeal working. Temporary arrangements have had to be made to free lines and platforms for reconstruction at one spot, to be followed immediately by similar arrangements adjacent. The John Street entrance has just been closed and is replaced by a new one at the other end of the same building, complete with new booking office, &c. At present it serves, as a temporary measure only, platforms 3 and 4, the latter, as reconstructed, just having been opened, and No. 1 closed.

A new signal box spanning all lines into the station is being erected, and the old mechanical signalling will be replaced by multiple-aspect colour lights in the station section, and by the same, but automatically controlled, from Leman Street to Bow Junction. All points will be electrically operated from the Fenchurch Street box; energy is supplied by the West Ham Corporation, with a stand-by plant in case of failure, switching in being automatic. The whole of the works is expected to be finished early in 1935 and the station should be in full operation before Easter. The station deals not only with L.N.E.R. trains to and from Stratford, Ilford, Brentwood, Woodford, Leyton, Loughton and North Woolwich, but also with L.M.S. Barking, Dagenham Dock, Upminster, Laindon and Southend trains, and hence the traffic density within a very confined space which calls for these important remodelling works.

Railway Share Market

The stock and share markets have maintained a steady trend in favour of holders when comparison is made with quotations prevailing only a few months ago. Account-to-account operators may not have been as fortunate, but there is relatively little speculation of this description in the market for Home railway stocks. The slight reaction in prices in the gilt-edged market has caused a corresponding tendency in the prior lien stocks of Home railways.

Mersey 4 per cent. 1866 debenture stock exceptionally recorded an advance, the quotation being marked up 1½ points on Tuesday to 90-93. The yield is still substantially higher at 4¼ per cent. than is obtainable on other railway debenture stocks notwithstanding the rise in the price of the stock of about ten points this year. Another prior lien stock to record an advance was the South Eastern perpetual annuities. These were marked up 1⅜ to 27¼-28¼ and business was recorded twice at 28. To the uninformed it may be stated that these annuities are only 24,297 in number and they represent an annuity payment of £1 0s. 6d., the yield at the present price being 3½ per cent. As they are perpetual they are readily marketable among buyers of long-term investments. After touching 117½ Great Western 5 per cent. preference stock has come back to around 115, at which the yield is about £4 7s. per cent., a generous return for a full trustee security. The dividend was provided last year out of the reserve but it is estimated unofficially that this year's dividend should be fully covered by earnings. Transport "C" stock has maintained its attraction for many investors who anticipate the stock being placed on a 4 per cent. dividend basis for 1934-35 with possibly more if traffic receipts continue to improve, of which there is thought to be every prospect in view of the large number of visitors now in London and expected in the course of 1935. The stock has risen to 91 but even at this figure the yield on a 4 per cent. dividend basis is £4 7s. 11d. per cent.

Foreign railway stocks have been moving in an uncertain way. It is now possible to purchase £100 nominal of six important South American railways for an inclusive sum of about £100, probably the first time this has been possible. They include £100 ordinary stock of B.A. Great Southern, B.A. Western, Central Argentine, B.A. Pacific, Leopoldina and Antofagasta and Bolivia. The dividend yield is nil but possibilities of capital appreciation over a period of years are attracting investors who are prepared to take the long view.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1933-34	Week Ending	Traffics for Week: Total this year	Traffics for Week: Inc. or Dec. compared with 1933	No. of Week	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1933	Prices: Lowest 1933	Prices: Nov. 28, 1934	Prices: Yield % (See Note)
				£	£		£	£	£					
South & Central America.	Antofagasta (Chili) & Bolivia	830	25.11.34	19,590	+ 5,490	47	696,830	508,780	+ 188,050	Ord. Stk.	26	11 3/4	23	Nil
	Argentine North Eastern	753	24.11.34	6,036	− 3,125	21	158,789	200,332	− 41,543	,,	14 1/2	5	9	Nil
	Argentine Transandine	111	—	—	—	—	—	—	—	A. Deb.	55	40	50	8
	Bolivar	170	Oct., 1934	5,600	+ 750	43	59,950	62,050	− 2,100	6 p.c. Db.	10	5	10	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	15	11	13	3 15/16
	Buenos Ayres & Pacific	2,806	24.11.34	71,429	− 10,297	21	1,439,280	1,726,488	− 287,208	Ord. Stk.	26	9 7/16	10	Nil
	Buenos Ayres Central	190	4.11.34	$116,700	+ $22,500	18	$2,322,100	$2,149,400	+ $172,700	Mt. Db.	30	10	23	Nil
	Buenos Ayres Gt. Southern	5,085	24.11.34	116,979	− 60 903	21	2,529,781	3,246,001	− 716,220	Ord. Stk.	44 1/2	21 1/2	25	Nil
	Buenos Ayres Western	1,930	24.11.34	44,496	− 16,602	21	859,250	1,123,291	− 264,041	,,	34 1/2	15 3/4	22	Nil
	Central Argentine	3,700	24.11.34	101,227	− 56,828	21	2,461,458	2,871,762	− 410,304	,,	28 1/2	15	15 1/2	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	18	10	9	Nil
	Cent. Uruguay of M. Video	273	24.11.34	19.982	− 138	21	329.669	334,144	− 4,475	Ord. Stk.	20	8	10 1/2	Nil
	Do. Eastern Extn.	311	24.11.34	4,034	− 50	21	66.074	62,544	+ 3,530	—	—	—	—	—
	Do. Northern Extn.	185	24.11.34	1,934	− 14	21	36.536	35,737	+ 799	—	—	—	—	—
	Do. Western Extn.	211	24.11.34	1,344	+ 60	21	30,105	29,760	+ 345	—	—	—	—	—
	Cordoba Central	1,218	24.11.34	28.860	− 7,060	21	637,940	848,850	− 210,910	Ord. Inc.	9 1/4	2 1/2	4 1/2	Nil
	Costa Rica	188	Sept., 1934	16.684	− 1,648	9	49,839	64,775	− 14.936	Stk.	29	20	30	6 11/16
	Dorada	70	Oct., 1934	11,700	+ 3,500	43	102,400	78,400	+ 24,000	1 Mt. Db.	76 1/2	68 5/4	102 1/2	5 7/8
	Entre Rios	810	24.11.34	12.072	− 2,390	21	239,563	276,805	− 37,242	Ord. Stk.	26 1/2	9	13	Nil
	Great Western of Brazil	1,082	24.11.34	14,300	− 100	47	408,000	470,706	− 62,700	Ord. Sh.	23/6	1/2	5/8	Nil
	International of Cl. Amer.	794	Sept., 1934	$279,814	+ $65,830	39	$3,639,905	$3,499,968	+ $139,937	—	—	—	—	—
	Interoceanic of Mexico	—	—	—	—	—	—	—	—	1st Pref.	1/2	1/16	1/2	Nil
	La Guaira & Caracas	223/4	Oct., 1934	3.200	− 50	43	36,065	49,770	− 13,705	Stk.	16	10	8 1/2	Nil
	Leopoldina	1,918	24.11.34	22.720	− 1,080	47	1,200.740	1,161,058	+ 39,682	Ord. Stk.	20 1/4	10	9	Nil
	Mexican	483	21.11.34	$200,700	− $800	20	$4,562,100	$3,832,600	+ $729,500	,,	3	1/2	2	Nil
	Midland of Uruguay	319	Oct., 1934	12,938	+ 3,321	17	38.789	34,516	+ 4,273	,,	2	1	1 1/8	Nil
	Nitrate	401	15.11.34	14,719	+ 9,394	45	219.705	117.975	+ 101,730	Ord. Sh.	78/6	11/16	2 7/8	Nil
	Paraguay Central	274	17.11.34	4,660	+ 1,940	20	90,180	67,160	+ 23,020	Pr. Li. Stk.	72	49 1/2	74	8 1/8
	Peruvian Corporation	1,059	Oct., 1934	64,407	+ 10,107	17	250,845	216,868	+ 33,977	Pref.	15 1/4	5	9	Nil
	Salvador	100	17.11.34	¢11,361	− ¢3,639	20	¢192,307	¢276,715	− ¢84,408	Pr. Li. Db.	70	66 1/2	70	7 1/8
	San Paulo	1531/2	18.11.34	28.970	+ 1,904	46	1,365,914	1,384.885	− 18,971	Ord. Stk.	102	68	74 1/2	5 3/8
	Taltal	164	Oct., 1934	2,300	+ 605	17	9,205	7,088	+ 2,117	Ord. Sh.	15/4	5/4	17/8	5 5/16
	United of Havana	1,365	24.11.34	14,579	− 297	21	345,549	266,943	+ 78,606	Ord. Stk.	8	2	3	Nil
	Uruguay Northern	73	Oct., 1934	1,132	− 70	17	4,444	4,431	+ 13	Deb. Stk.	6	3 1/2	5 1/2	Nil
Canada.	Canadian National	23,733	21.11.34	631,072	+ 30,654	46	29.443,845	26,415,083	+3,028,762	—	—	—	—	—
	Canadian Northern	—	—	—	—	—	—	—	—4p.c.	Perp. Dbs.	60 1/2	38	77	5 3/16
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	99 5/4	85	104‡	3 7/8
	Canadian Pacific	17,018	21.11.34	523.200	+ 45,600	46	22,301,000	20,210,400	+2,090,600	Ord. Stk.	22 1/8	11	12	Nil
India.†	Assam Bengal	1,329	27.10.34	29.685	+ 2,117	30	803,783	686.929	+ 116.854	Ord. Stk.	79	70	87 1/2	3 7/16
	Barsi Light	202	3.11.34	1,762‡	− 3,540	31	83,745	91,005	− 7,260	Ord. Sh.	101 3/4	70	102 1/2	5 7/8
	Bengal & North Western	2,112	3.11.34	43,889	− 3.985	5	198,878	205.830	− 6.952	Ord. Stk.	292	240	291 1/2	5 1/2
	Bengal Dooars & Extension	161	3.11.34	3,822	− 638	31	91,783	90,031	+ 1,752	,,	127	119	125 1/2	5 5/16
	Bengal-Nagpur	3,269	27.10.34	96,000	− 1,705	30	3,281,115	3,014,995	+ 266,120	,,	97 1/4	83 1/2	104 1/2	3 15/16
	Bombay, Baroda & Cl. India	3,072	17.11.34	153,675	+ 1,050	33	4.890,525	4.675,425	+ 215.100	,,	112	107	114 1/2	5 1/4
	Madras & South'n Mahratta	3,230	27.10.34	92,175	+ 9,442	30	3,337,467	3,249,668	+ 87,799	,,	127	114 1/4	125 1/2§	7 9/16
	Rohilkund & Kumaon	546	3.11.34	8,008	+ 290	5	37.366	35.120	+ 2,246	,,	260	225	258 1/2	5 13/16
	South India	2,526	20.10.34	74,292	+ 4,303	29	2,378,076	2,286,052	+ 92,024	,,	119 1/2	112	117 1/2	6 15/16
Various.	Beira-Umtali	204	Sept., 1934	63 487	+ 15.845	52	651,264	502,517	+ 148,747	—	—	—	—	—
	Bilbao River & Cantabrian	15	Oct., 1934	524*	− 1,064	43	16,719	15,408	+ 1,311	—	—	—	—	—
	Egyptian Delta	621	31.10.34	9.847	− 469	30	130,946	119,375	+ 11,571	Prf. Sh.	15 1/32	15/4	2 1/2	4
	Great Southern of Spain	104	17.11.34	2,193	− 709	46	102,851	102,717	+ 134	Inc. Deb.	4	3	3 1/2	Nil
	Kenya & Uganda	1,625	Mar., 1934	240,520	+ 21,064	12	638,137	606,192	+ 31,945	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	53	33 1/2	46 1/2	7 1/2
	Mashonaland	913	Sept., 1934	114,596	+ 26.892	52	1,191,218	819,297	+ 371.921	I Mg. Db.	91 3/4	42	99	5 1/16
	Midland of W. Australia	277	Sept., 1934	13,638	+ 1,333	9	39,590	38,162	+ 1,428	Inc. Deb.	89	70	97 1/2	4 1/8
	Nigerian	1,905	6.10.34	24,036	+ 990	27	700,407	600,090	+ 100,317	—	—	—	—	—
	Rhodesia	1,538	Sept., 1934	183,340	+ 18,488	52	1,993,827	1,505,845	+ 487.982	4 p.c. Db.	98 1/2	80 3/4	104	3 15/16
	South African	13,217	3.11.34	562,068	+ 50,717	31	15,674,360	13,827,598	+1,846.762	—	—	—	—	—
	Victorian	6,172	Aug., 1934	740,142	+ 27,143	8	1,433,140	1,380,045	+ 53,095	—	—	—	—	—
	Zafra & Huelva	112	Oct., 1934	13,759	+ 438	43	116,325	112,900	+ 3,425	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16.

* Rebellion. † Receipts are calculated @ 1s. 6d. to the rupee. ‡ Kartiki Fair, 1933. § ex dividend. Salvador receipts are in currency.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rate of exchange and not on the par value.